COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper — Second-class postage paid at Boston, Mass., and additional mailing offices — © 1974 by Computerworld, Inc.

:/year — December 18, 1974 — Vol. VIII, No. 51

Training Commitment a Vote for Competence

Professional Development

By Edith Holmes
Of the CW Staff

TOWSON, Md. – When client companies ask for some indication of expertise, a data services organization here points to its professional development program as evidence of its interest in competence.

"Our people working toward commercial assignments in client environments spend 10% or more of their time in data processing, management and manufacturing systems training," Richard Nemerson, director of training and development planning with Martin Marietta Data Systems (MMDS), said.

"As an organization committed to data services, we plan to apply about 20 man-years to training our people in 1975, an expansion over MMDS's 1974 expenditure of 16 to 17 man-years." This represents an investment in excess of 4,000 student days, according to Nemerson.

A division of Martin Marietta Corp., MMDS sells proprietary software and resource management services and provides some remote job entry processing for manufacturing and distribution companies. Providing services in-house as well as for outside clients, some 800 of the division's 1,200 employees are DP professionals, Nemerson estimated.

Because it must prepare professionals for client companies with sufficient backup for MMDS's own DP needs as people are selected to do outside jobs, the training program has to be both

(Continued on Page 4)

NEWS IN BRIEF

Two-Tier Pricing Part Of FCC's DDS Okay

WASHINGTON, D.C. – AT&T's Dataphone Digital Service (DDS) can begin operating under an interim two-tier pricing system, according to a Federal Communications Commission (FCC) ruling made last week.

The FCC told AT&T that it can offer DDS at its proposed low rates in five cities: Boston, New York, Philadelphia, Chicago and Washington, D.C.

Also authorized for DDS service were 19 additional cities where AT&T will have to charge higher rates equivalent to current high/low density charges.

The dual pricing system is temporary and will be effective for one year, the FCC said. But during that time users will be paying two levels of rates for the same data service depending on their geographic locations.

Compromise Reached On New Privacy Bill

WASHINGTON, D.C. – The House and Senate Government Operations Committee chairmen and the two ranking Republican members have reached a compromise on a privacy bill "to consist of the Moorhead Bill with a few Senate amendments," according to a Capitol Hill spokesman.

Senators Sam J. Ervin (D-N.C.) and Charles Percy (R.-Ill.) met with representatives to resolve their differences as a substitute for convening what could have been a cumbersome, time-consuming conference session.

The compromise bill will apply only to federal government information systems. All references to the private sector as well as criminal records were omitted [CW, Dec. 11].

The right to challenge contents of data files was retained, as was the requirement that data be updated and checked for accuracy any time a determination is to be made about an individual. Restrictions will be placed on the use of the Social Security number.

Finally, a privacy commission with no enforcement powers has been included.

DP Center Rechecking Security

System Stops $902,000 Fake Check

By Marvin Smalheiser
and Patrick Ward
Of the CW Staff

LOS ANGELES – This city's municipal computer system saved Los Angeles from picking up a $902,000 tab when its verification software rejected a fake check recently.

The manager of the city's Data Services Bureau (DSB) and other city officials are double-checking their security measures as they try to find out who stole 17 of the blank treasury checks that the DP center uses for computer check printing. Police say only four of the checks have been located.

Initial speculation was that an insider had programmed the city's computers to produce the checks. However, police say they believe the four checks that have turned up were not printed out on the computer center's machines.

Instead, they now suspect that the fraud was an entirely manual operation based on the theft of 17 blank, IBM-manufactured municipal treasury checks.

Programmers Not Involved

"There is no evidence that our programmers and analysts were involved," said T. Tamaru, general manager of the DSB, which contains dual IBM 370/155s under OS/MVT.

The one check that was cashed "was not printed on our computers – there are three discrepancies in that check that indicate it was done on the outside somewhere," he said.

Tamaru said he learned 17 of the numbered checks were missing on March 17 and reported the fact to a city official, who now says that it was assumed the checks were just misplaced and that it was therefore unnecessary to warn banks or police.

Tamaru said he doesn't believe that the checks were taken from the security-conscious DSB, although it is one of four places from which they could be stolen.

Other possible theft sites are IBM's manufacturing plant in Campbell, Calif., the interval when the checks were transported to Los Angeles and the city controller's office.

The checks arrive in boxes of 3,000 at the controller's office. Each box is sealed with strips of masking tape and DSB personnel sign for them and log them in.

The boxes of checks are kept in a wire cage in the DSB's emergency operations center. Employees must use both a badge reader and a key to gain entrance, and they also have to wear a badge with their photograph and physical description as they pass by a guard.

Computer operators under the supervision of their shift supervisors open and reseal each box an average of 10 times before all the checks in it are used.

(Continued on Page 2)

Nasis Drafts Law to Thwart State-Level Privacy Invasions

By Nancy French
Of the CW Staff

LEXINGTON, Ky. – A model law to protect individuals from state government privacy violations has been drafted and endorsed by the National Association for State Information Systems (Nasis).

The draft is being considered at a conference on state and local implementation strategy for privacy legislation hosted by the Domestic Council on the Right of Privacy this week in Washington, D.C.

Similar to the bill passed by the U.S. Senate (S. 3418) [CW, Dec. 4] and the law enacted in the state of Minnesota [May 8], the Nasis act acknowledges government's need to collect personal information to perform certain functions but emphasizes the need to assure information collected and maintained remains confidential.

Central to the proposed act is a privacy individual or committee with responsibility for setting up specific procedures to be followed by agencies in the collection, storage or dissemination of personal information and for carrying out the purposes of the act in general.

The committee is charged with approving plans for new personal information systems and regular inspection of systems to assure agencies are in compliance with the law.

Other responsibilities suggested for the board include investigation of alleged violations and adoption of regulations to promote security, confidentiality and privacy procedures.

Limits of Authority

The bill assigns the committee responsibility for creating regulations to prescribe limits of authority for persons with access to personal information, methods for obtaining interpretations of the privacy law and policies and procedures to insure the security of personal information systems.

The draft also authorizes the committee to establish standards for employment,

(Continued on Page 4)

Societies Set to Join Caravan

NEWTON, Mass. – National and local representatives of several professional societies will join with *Computerworld* in conducting and participating in several sessions during the 1975 Computer Caravan.

The traveling conference and exhibition, which takes to the road Feb. 24 in Atlanta, will feature a special panel discussion on professional development in the afternoon of each opening day.

The special afternoon session, slanted toward the needs of local users, will also include a national "position paper" given by the Institute for the Certification of Computer Professionals (ICCP).

The Society of Certified Data Processors (SCDP) will also have a representative on each of the nine panels.

SCDP and the ICCP have been at odds regarding the future of the licensing of computer professionals and, while the issue of licensing is likely to be included in the SCDP material, the prime focus of its participation will be an assessment of each local labor and educational situation.

Other issues to be examined during the professional development panel will be:

- Career pathing for programmers and operators.
- Local training alternatives.
- Avoiding technical obsolescense for managers.
- The executive interface (how execu-

(Continued on Page 4)

On the Inside This Week

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
The Mag. U.S. Pat. Off.

EDITORIAL
Editor — E. Drake Lundell Jr.
Managing Editor — Thomas Geyer
Associate Editor/Technical News — Ronald A. Frank
Hardware Editor — Victor J. Farmer
Software Editor — Donald Leavitt
Assistant Editor/Computer Industry — Molly Upton
Staff Writers — Nancy French, Edith Holmes, Patrick G. Ward, Toni Wiseman

Chief Copy Editor — Judith Kramer
Copy Editors — Cheryl M. Gelb, John P. Hebert

Editorial Assistants — Catherine Arnst, Ann Dooley

Bureaus:
West Coast — Marvin Smallheiser
Europe — J.H. Bonnett
Asia — Hidetsuna Sasaki

Contributors:
Education — J. Daniel Couger
Taylor Reports/Professional Practices — Alan Taylor

Vice-President/Editorial Services — Edward J. Bride

SALES
Vice-President/Marketing — T. Neal Wilder
Sales Administrator — Dorothy Travis
Traffic Manager — Judy Milford
Classified Advertising — Sara Steets
Market Research — Kathryn V. Dinneen

CIRCULATION
Vice-President/Circulation — Margaret Phelan
Assistant Manager — Barbara Jeannetti

PRODUCTION
Manager — Leete Doty
Supervisor — Henry Fling

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529.

OTHER EDITORIAL OFFICES: Los Angeles: 9031 N. Edgecliffe Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW1 9PF, England. Phone: (01) 485-2248/9. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

50 cents a copy; $12 a year in the U.S.; $20 a year for Canada and PUAS; all other foreign, $36 a year. Four weeks notice required for change of address.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

COMPUTERWORLD, INC.
President/Publisher — Patrick J. McGovern
Executive Vice-President — W. Walter Boyd
Vice-Presidents — Edward J. Bride, Margaret Phelan, T. Neal Wilder
Editorial Director — Dr. H.R.J. Grosch

IFIP ABP AIA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.

GAO Study on Federal Agencies

Progress Slow in Data Exchange

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Federal agencies have made little progress toward exchanging data in machine-readable form for direct input to computers, a spokesman for the General Accounting Office (GAO) said here recently.

While standardization of data elements and codes could reduce the $5 billion spent annually to run the government's 6,200 computer operations "by eliminating unnecessary duplication and incompatibilities in collecting, processing and disseminating data," a report issued to Congress by the GAO earlier this year indicated most agencies continue to exchange data in hard-copy form.

Just prior to the report's publication, the spokesman said, the Department of Commerce announced policies which would establish a government-wide program for such standardization.

But he noted little support and cooperation has come from the agencies in this area since either the report's publication or the Commerce Department's announcement.

The GAO study cited a past General Services Administration survey of 14 civil departments and agencies indicating "the vast majority of the reports generated – 52,000 of about 54,000 or 97% – were exchanged in paper form."

Of the remaining 1,800 reports, 1,250 were transferred in an automated form and 550 were punched or punched.

Reporting they planned to convert 1,200, or only 2%, of these hard-copy reports to machine-readable form, the departments and agencies surveyed noted most of this automation would be intra-departmental.

Guidance Necessary

Clearly, "before agencies will commit resources to a standardization program, greater central guidance is needed so their products can be made comparable and applicable governmentwide," the GAO report asserted.

And because responsibility for this program was given to the Secretary of Commerce in May 1973, the report directed its recommendations to that office. A copy of the report was also sent to every federal agency head.

To further accelerate the development and use of standard data elements and codes, the GAO suggested the Secretary of Commerce first determine where standards would be most beneficial and then establish standardization priorities.

Policy statements outlining guidelines, methodology and criteria for agencies attempting standardization should follow priority determinations, the report said.

Once he has made particular agencies responsible for developing standard data elements and codes in specified areas, the Secretary of Commerce should monitor standards implementation to insure uniform adoption and use, the GAO concluded.

Recognizing the need for agency support, the report emphasized the ease with which data can be transferred when "originally collected and recorded in a standardized, agreed-upon fashion."

Heads of departments and agencies have been asked to propose future subjects for standardization, according to the GAO spokesman. From their comments, new areas for standardization would be identified and priorities would be established on the basis of each agency's needs.

"Standardization of the government's computer systems represents the best area for improving productivity in the whole country," the spokesman said. "Yet agency cooperation continues to be a problem."

Also in accordance with the GAO report recommendations, the National Bureau of Standards has developed some guidelines for standardization policies but has yet to assign tasks for further development of these guidelines to the various agencies, the spokesman noted.

Inaccurate Records Jeopardize NCIC Criminal Histories System

By Nancy French
Of the CW Staff

SAN FRANCISCO – Failure to report accurate and complete arrest information to the National Crime Information Center's Computerized Criminal Histories (NCIC/CCH) network has placed the entire system in jeopardy, NCIC policy advisory board members were told here recently.

"Legal actions are being initiated every day by persons who feel they are being victimized by inaccurate arrest reporting by criminal justice agencies," explained Robert Edgren of the Arizona Department of Public Safety.

"While considerable done little to assist law enforcement by providing complete disposition information, it is the ultimate responsibility of law enforcement agencies to obtain this information to avoid curtailment of dissemination."

Of the principal problems plaguing the criminal record reporting process, Edgren called "updating records to conform with the uniform offense code" one of the most serious.

"In the case of old records in particular," he said, "one jurisdiction may have referred to 'shoplifting' as 'willful concealment' while another may have called it 'concealing stolen property.'"

For OBTS purposes, he said, coding clerks must be taught that these charges will be coded under "shoplifting."

And "willful concealment" and "concealing stolen property" also may have been used by other jurisdictions when the crime was "possession of stolen property" or "receiving stolen property" – quite a different charge, he pointed out.

"If you are working with a fingerprint card, you can refer to the statute code to determine what crime has actually been charged, but when you are converting or updating records from an FBI rapsheet the other state's statute code is not always available and someone must make a decision on the charge or the record must be set aside until the agency of record can be contacted for clarification," he said.

Another problem cited by Edgren was multiple entries by more than one agency for a single arrest.

"For example," he said, "a municipal police department will arrest a subject for a charge of 'burglary.' The police department will take a set of fingerprints indicating a charge of 'burglary' and send the card to the FBI."

But too often, when the police department transfers the subject to the sheriff's department detention facilities for holding purposes the day after the arrest, the sheriff's office will take another set of fingerprints and indicate a charge of "burglary" rather than indicating it is holding the prisoner for another jurisdiction.

"This creates a false record on the rapsheet which will show two arrests for "burglary" by two different agencies on successive days," he explained.

The problem becomes even more difficult when the original charge of "burglary" by the police department is reduced by the sheriff's department to "trespassing" on the basis of insufficient evidence, he noted.

"The sheriff's card is sent in with the charge of trespassing, and we are then faced with the question of whether or not to ignore the obvious discrepancy or to go ahead and try to correct the record," he said.

"This is very time-consuming and it necessitates calling each of the agencies involved to determine what actually transpired."

L.A. System Catches Fake Check

(Continued from Page 1)

Tamaru said there are about 30 employees, all with police background clearances, who are allowed to open and close the boxes.

"We have never had a report of a box being tampered with," he said, but he agreed that a "good crook" would make sure he left it sealed.

Police now have the four checks from the fraud attempt plus five that were confiscated in a separate investigation last August, totaling 13 still missing.

The cashed check was made out to Crocker International Bank in New York City for transfer to a coded account in the Banque Nationale de France.

Three other fraudulent checks, all dated Nov. 18, were never cashed. They were made out to the Mercantile Trading Corp., 30 N. LaSalle St., Chicago, for $856,729.42; National Equipment Corp., 200 Park Ave., New York City, for $880,195.12; and to Schaffer Supply Corp., Mayfield Square Building, New York City, for $826,987.53.

The fraudulent checks were to be "laundered" by intercity transfers through a number of accocon, chief of the Los Angeles District Attorney's Intelligence Division.

Howard has reportedly been linked in Senate hearings with Carmine Lombardozzi, an associate of Carlo Gambino, reputed New York Mafia chief.

Anderson said he saw a connection with organized crime "primarily in the background and the associates" of the two arrested men.

Investigation of the fraud scheme began about three weeks ago when an informer tipped off the U.S. Senate's Permanent Subcommittee on Investigations, which specializes in white collar and organized crime.

Two men were apprehended on Dec. 7 as they walked outside of the Beverly Wilshire Hotel at 12:30 a.m. carrying what they allegedly believed was their $1.2 million share in three of the fraudulent checks.

The parcels they were carrying were actually filled with blank paper and cut up telephone books. Police were reluctant to talk about who gave them the three uncashed checks or handed the two men the bags of fake money.

Police arrested Morton Freeman, 47, of Palos Verdes, Calif. and Bernard Howard, 52, of Yonkers, N.Y.

Freeman and Howard were booked on charges of conspiring to commit grand theft, conspiracy to commit forgery and attempted grand theft and forgery.

Both men were being held in the Los Angeles County Jail last week in lieu of $100,000 bail. Arraignment was scheduled for early next week.

Freeman may have been acting as a courier between Howard and someone on the East Coast, according to Capt. Clayton Anderson, chief of the Los Angeles District Attorney's Intelligence Division.

Progress Report:

370/STOR 145

IT'S OFF TO THE KIND OF START YOU'D EXPECT FROM CAMBRIDGE.

In the 12 months since its first delivery, 370/STOR 145 has become the best-selling independent expansion memory for IBM Model 3145 processors. Maybe that's because it can be delivered very fast, or offers more modular expansion, or more complete memory protection, or faster interconnection. Or then again, maybe it's because Cambridge is the only independent supplier of IBM add-on memory that designs and manufactures the products it sells and services. Whatever the reasons, here are the results:

SHIPMENT RATE

Shipments of 370/STOR 145 have doubled every quarter for the past 12 months. Our worldwide user base now includes almost every size and type of 3145 site, and new users can expect 30-day deliveries.

AVERAGE CAPACITY

Early users played it safe, ordering an average of 131K of expansion memory. No longer. Now the average order exceeds 393K and is growing. 370/STOR 145 is past proving itself. Today, it is relied upon as a cost productivity tool.

UPTIME PERFORMANCE

Big new memories usually have some bugs. The idea is to get rid of them fast. The average 370/STOR 145 is now rapidly approaching the superior uptime rates of our 370/STOR 155 memory – which is considered the leader in the memory business. Of course, its multitude of built-in error correction features help that statistic.

INSTALLATION SPEED

When 370/STOR 145 was introduced, Cambridge promised 24-hour installation. It took a while for us to meet that goal, but now we are installing in less than 20 hours. The main point is this: who else in the world would even make such a promise?

CAMBRIDGE.

A good place to put your information.

cmi Cambridge Memories, Inc. 12 Crosby Drive, Bedford, Mass. 01730 (617) 271-6400

Contact our sales offices for further information: Boston (617) 271-6400 • Hartford (203) 633-8714 • Philadelphia (215) 295-1186 • Columbus, O. (614) 459-0154 • Kansas City (913) 371-3352 • Atlanta (404) 252-1382 • San Francisco (415) 692-4806 • New York City (201) 947-0184 • Rochester (716) 637-2229 • Chicago (312) 449-5260 • Detroit (313) 557-4080 • Washington, D.C. (301) 657-9105/6 • Dallas (214) 231-4804 • Los Angeles (213) 822-1166.

Commitment to Training a Vote for Competence

(Continued from Page 1)

formal and ongoing, he commented.

The current professional development program is available to everyone in the company and can be used as a basis for personnel review and evaluation as well as for training. Nemerson also noted that individualized plans for career development help to fuse employees' personal goals with MMDS's specific approach to systems development.

Define Job Requirements

With the aid of Q.E.D. Information Sciences, Inc., MMDS first approached its training needs by defining skill and knowledge requirements for its various DP and management jobs, according to Nemerson.

"We spent the better part of a year making sure each position had a job description and a list of skills requirements," he said. "We then identified courses and options needed to meet the demands of each position."

Out of this research effort came a career and development reference guide containing career path charts, matrices of courses-to-job programs and detailed descriptions of course contents, Nemerson explained.

MMDS employees can use the reference guide to select courses and an overall career program. He or she then discusses these plans with a supervisor who signs the plan along with the employee.

Nemerson emphasized that the guide "is not meant to be a straight-jacket," but rather to provide direction in meeting specific job or career path objectives.

Eighty course modules are described in the reference guide, and most of these are both developed and taught by the MMDS training staff, he remarked. "Occasionally, technical topics not related to the firm's methodologies for system development will take us to outside vendors as well," Nemerson added.

He noted that when a course requires an outside vendor, "we can use the course description developed for it as a shopping list item for comparing course outlines, objectives and contents.

"We have a full-time, dedicated staff, supplemented by additional people as needs dictate," he commented.

Instructors are provided with instructor guide formats, including course outlines, indices to audio-visual aids and bibliographies. By making this kind of documentation available for each course, "we have the backup needed should the person who develops the course be unable to teach it," Nemerson said.

MMDS develops its own student materials for those courses taught in-house. Video-assisted-instruction programs from Advanced Systems, Inc. are used for some technical subjects, and in some cases, the firm has created homemade videotapes for training, according to Nemerson.

At this point, the training program has evolved into an internal institute for career development, in Nemerson's view. He anticipates that, in another six to eight months, MMDS will be able to make parts of this institute available to outside companies. In addition to providing courses in data processing, the institute will also have instruction in manufacturing and management techniques.

At present, the DP function of a resource management client can elect to become part of MMDS if the company so desires. In these instances, the client company's data processing employees then have access to the course and career opportunities offered by MMDS, according to Nemerson.

As with firms buying MMDS's resource management services, companies purchasing software can receive whatever backup training they need on how to use these packages, he said.

Nasis Drafts Law to Thwart State-Level Privacy Invasions

(Continued from Page 1)

conduct and discipline for persons with access to information systems, standards for access and the need-to-know for state employees and guidelines and procedures for purging.

A continuing program for auditing and verifying the accuracy and completeness of records contained in personal information systems will be set up by the committee, according to the draft.

In addition, the draft allows the committee to place restrictions on interagency use of files but exempts certain files, such as mailing lists, which are intended for normal office use.

Under the draft the committee would also be responsible for submitting an annual report to the state legislature and the governor on all confidential and public information systems kept by the state and its political subdivisions, including the name, title and address of the person responsible for each system.

Conspicuously absent from the proposed legislation are any references to general policy for use of the Social Security number and procedures for law enforcement records.

States Responsible

The proposed law would make the state government responsible to persons on whom information is stored with regard to access, knowledge of and correction of files.

Upon request "to a responsible authority," a person would be informed whether he is the subject of stored information and, if so, may be shown the information without any charge. It would therefore be incumbent upon the state to establish such a "responsible authority."

The bill also gives individuals the right to challenge the accuracy and completeness of information stored about him and requires agencies to correct the erroneous data within 30 days and inform those who have received the information within the past two years of the changes.

Information in dispute "shall not be disclosed except under conditions of demonstrated need and then only if the person's statement of disagreement is included with the disclosed information," the proposed bill states.

The purpose for which personal information is collected and used shall be filed in writing by the agency and be a matter of public record, according to the bill.

A person asked to supply information shall be informed of all the intended uses of the information, whether he may refuse to supply the information and any known consequences arising from a refusal to supply information.

An agency that wishes to use information for a purpose other than that known by the subject of the information must file with the privacy committee, request legislative authority or obtain informed consent from the person to whom the information pertains.

Finally, the proposed bill suggests that government agencies be required to omit from their files any personal information collected from anonymous sources except those exempted by the committee or by state statutes.

Societies Set to Join Caravan Traveling Show

(Continued from Page 1)

tives and managers in the DP function communicate their needs and capabilities.

After Atlanta, the Computer Caravan will visit Philadelphia, Hartford, New York, Cleveland, Chicago, St. Paul, Seattle and San Francisco.

'New Exposure' for Societies

Besides SCDP and the ICCP, local chapters of the Data Processing Management Association (DPMA) and/or the Association for Systems Management (ASM) have expressed a desire to participate in six of the nine Caravan cities, reported Edward J. Bride, CW vice-president for editorial services.

"The societies are making an important contribution" in bringing their efforts to the Computer Caravan. This has occurred in the past "but never to this extent," Bride said.

"They obviously see a new exposure for themselves," he added, "as many past Caravan attendees have not been members of professional societies."

"Communications" is the goal of the Philadelphia chapter, Data Processing Management Association, according to Chapter President Donald J. Devine.

"There is never too much opportunity for professionals to communicate with each other," he commented, adding "there is too little communication between the professional societies."

The New York chapter of the Association for Systems Management feels that by participating in the Computer Caravan "it will make known its facilities and opportunities for systems people to join an organization dedicated to their field," according to Grant Morris, vice-president, New York chapter, ASM.

In explaining ICCP's reason for accepting the CW invitation to participate, Merton Walker, who is coordinating the ICCP effort with local representatives, called the session a "good place to convince our friends in the computer industry that they really are professionals, whether they believe it sometimes or not."

He agreed that "visibility" for ICCP was part of the rationale for acceptance, and noted that the president of ICCP, John Swearingen, Vice-President Fred Harris, and Secretary Paul Pair would be among the various panel participants in Caravan cities.

Besides the panel session on opening day, which will be open to all Canvan attendees, afternoon programs on the second and third days will be devoted to virtual storage and "the human interface," respectively.

IBM Chairman Labeled It 'Repugnant'

Police Group Blasts Disavowal of Security Course

By Patrick Ward
Of the CW Staff

WASHINGTON, D.C. – IBM Chairman Frank T. Cary's disavowal of a recent training course for the firm's security officers [CW, Dec. 4] has brought a sharp response from the International Association of Chiefs of Police (IACP), which said it designed and wrote the training program with IBM's approval at each step of the way.

"By innuendo and generalized comment, you have created the impression that the IACP materials are somehow abhorrent to human, or at least IBM, sensibilities," the IACP said in a letter to Cary.

Cary's statement that he was "shocked" and found the course material "repugnant" destroyed "whatever charity we may have felt toward what you apparently perceived as a corporate embarrassment," the letter stated.

The police association said it had referred the matter to its legal counsel because it felt the statement from Cary's office had damaged IACP's reputation and its relationship with its clients.

IBM originally requested the IACP to prepare training materials and to conduct sessions in security for the computer corporation's security personnel, the IACP letter stated.

The police group was to both evaluate IBM's current personnel and property protection program and to design a training course on the state of the art in corporate security. It was also to provide an assessment of how IBM might strengthen its own program, the IACP said.

"We were encouraged repeatedly by IBM staff . . . to present the total spectrum of [IBM's] vulnerabilities and allow IBM personnel to make their own judgments as to what options would be appropriate for IBM," the IACP explained.

The controversial instruction session on how to combat terrorism with a counter-intelligence network was only a two-hour section of a 42-hour "well-balanced security training program," the IACP said. Other blocks included "The Role of Private Security in the Criminal Justice System," "The Culture of IBM as a Setting for Security" and "The Role of Civil Law in Corporate Security."

Also on the curriculum were "IBM as a Target for Terrorists," "Executive Protection," "Recognizing the Threat of Industrial Espionage to IBM's Corporate Well-Being" and "Preparing IBM Employees for a Role in Security."

IBM Approved Outline

The IACP noted that its training outline was approved by IBM security administrators in August 1974. Certain changes were made at IBM's suggestion and "on the basis of the outline, a manuscript was submitted to IBM for review, evaluation and editing."

The IBM reviewers made some suggestions, and the course manuscript was ultimately delivered to IBM for typesetting and printing.

"All of the training material was printed by IBM with both the IBM and IACP logos on each section," the IACP letter noted.

Six IBM security administrators next went through a "dry run" of the training course in which "the proposed training methodology was described and the developed material reviewed in depth," the IACP said.

The IBM executives' recommendations were incorporated into the training program and, during November, 18 of the computer maker's security personnel took the course.

"At no time was any objection raised to the content of the training materials covered," the police group said in its letter.

Methods Not Illegal

After the training session, part of the course manuscript made its appearance in *the Berkeley Barb* and IBM followed with a disclaimer that the material was "the exclusive product of the IACP and did not represent the attitudes, values, policies and procedures of IBM," the association's letter observed.

The IACP emphasized in its letter to Cary that it has "never at any time advocated, suggested or recommended security measures that are illegal, immoral or unethical."

This includes creation of "spy networks," "clandestine operatives" or the use of "the right kind of provocateur." While granting that such techniques may have been discussed in the training course, "they are no more part of the IACP's policy than they are of IBM's," the letter said.

As for discussions on the acts or pronouncements of terrorist or violence-prone groups that may have an ethnic or racial membership, the IACP said that such talk "can hardly be condemned as discriminatory or insensitive on the contention that the law-abiding members of these minority groups will be offended."

And, finally, the IACP said "training materials created and employed for specific legitimate purposes should not be . . . analyzed independently of their purpose and intent."

The IACP ended its letter to Cary with a postscript: "We regret the necessity of terminating what we feel is a valuable security training program. However, past events and your personal attitude toward this program clearly signal IBM's lack of concern for corporate security.

"We at IACP feel that this contribution was professional and, taken in context, a balanced security presentation. Your statements disavowing our contribution have been especially offensive to us as they directly infer that the material we presented to you was not suitable, but rather "repugnant" to you as a corporation.

"Our reputation as a professional association has been damaged by such inferences and statements, since IBM has thereby created the impression that the IACP is encouraging inappropriate tactics for the corporate security sector in dealing with potential threats," the letter said.

"On the contrary, we are encouraging a closer unity and working relationship between private and public security functions and are emphasizing the importance and responsibilities of the role of private security in all phases of the protective services.

"You should be aware that our policy in this and all related matters is one of openness. The materials provided to IBM and the circumstances of their production are not considered by IACP to be confidential or clandestine in any manner. Again, I urge you to make this total program available to the public through responsible members of the press. We intend to respond freely, factually and completely to media inquiries on this matter and suggest that you do the same."

Projects Sponsored by GAO

DP and Vote Counting, Reprecincting Under Study

WASHINGTON, D.C. – In response to the needs of local and state jurisdictions, the General Accounting Office (GAO) is sponsoring two projects in an effort to merge the requirements of election offices and data processing departments.

Projects on the development of an automatic reprecincting model and the determination of standards for computerized vote counting are under way at the Bureau of Census and the National Bureau of Standards (NBS), respectively, a GAO spokesman said.

Based on the Census Bureau's 1970 Dime File and on a technique known as geographic coding, the reprecincting model should eliminate the tedium of revising area subdivisions by hand, he commented.

Written in Fortran and designed to be adaptable to almost any computer system, the model will be completed and tested here next summer. The spokesman noted it will be made available free of charge to any of the some 200 jurisdictions with a Dime File listing resident names and addresses.

Vote Tabulation Standards

The NBS effort to develop standards for computerized vote tabulation began a year ago with a two-day conference held at the GAO. Including DP personnel, election administrators and computer experts, the conference was designed to familiarize the NBS with the problems involved in the vote counting process, the spokesman indicated.

In the past year, NBS has visited several jurisdictions around the country to see how they handle their elections, he said.

Having researched the field of automated election returns, the NBS is preparing a report on its findings, to be released free to any interested jurisdiction in March 1975.

Those with questions or comments concerning either project should contact Gary Greenhalgh or Jack Brock at the GAO, 441 G St. N.W., Washington, D.C. 20548.

Ervin Says Watchdog Needed If National Insurance Enacted

KEY BISCAYNE, Fla. – If a national health insurance plan is to become a reality, a watchdog commission will be needed to keep tabs on the government's "insatiable appetite" for collecting private facts about people's lives, Sen. Sam J. Ervin (D-N.C.), chairman of the Senate Judiciary Committee, said at a recent conference of the American Psychiatric Association here.

Asked if he would consider heading such a commission when he retires from the Senate in January, Ervin replied, "That would be like a fellow saying to a girl, 'If I ask you to marry me will you accept my proposal?'

"The advent of computer technology in government filekeeping is pushing the country toward mass surveillance unprecedented in American history."

He called for state laws providing that confidential communications between psychiatrists and patients constitute privileged communication.

This information, according to Ervin, must be guarded in judicial proceedings even in the face of a subpoena demanding its disclosure as evidence.

"Government computers have a great memory but no heart," he said.

Control of Telecommunications Systems

'NLETS' Official Calls for National Policy

By Nancy French
Of the CW Staff

PHOENIX – Too many decisions are being made about computerized law enforcement recordkeeping and telecommunications systems by people in Washington who don't have all the facts, simply because law enforcement practitioners aren't speaking up, Larry Beddome, executive director of the National Law Enforcement Telecommunications System (NLETS) told a recent conference on New Systems in Law Enforcement and Criminal Justice here.

"I was very disappointed to see that of all those testifying before the House and Senate committee hearings on the various privacy bills this spring that only five or six law enforcement practitioners – the guys who should be making their needs and problems known – even bothered to testify," he said.

An essential link in criminal recordkeeping is the telecommunications system over which this information is transmitted, according to Beddome, and "it's time to set a basic national policy."

Referring to the philosophical dispute over who should control a nationwide telecommunications system linking law enforcement agencies – the states or the FBI – Beddome said, "Technology has given us the ability to assure effective and efficient telecommunications services, and policy must assure that responsibility is vested in organizations that are most likely to provide that service in a way consistent with our philosophy of government," he said.

At the present time there are two nationwide law enforcement telecommunications systems, he said: NLETS, a system run and financed by the state governments, and the National Crime Information Center (NCIC), operated by the Federal Bureau of Investigation (FBI), funded by legislative appropriations, with services provided to the states free of charge.

Control Questions

The development of the computerized criminal history (CCH) system and the FBI's plan to make this information available to the states via a new federally run switching system raises serious questions of control, Beddome said.

"While some states may find this new 'free' service attractive, federal control over state police activities should be of concern to us all," he said.

With a federally controlled telecommunications system "we won't need a national police force," Beddome added.

A study by the Jet Propulsion Laboratories funded by the Law Enforcement Assistance Administration (LEAA) has identified several alternative networks from the point of view of physical characteristics, he continued.

While they haven't considered the political aspects, it is well known that adoption of any one of the six alternatives will create some "winners" and some "losers," some who will lose their power and some who will gain more.

It is this problem that creates resistance, according to Beddome. But the nation must decide, he said, because without a national policy, law enforcement agencies are floundering.

Bedomme outlined the available choices:

- Continue the present two networks – a plan that is opposed by the Office of Telecommunications Policy (OTP) as well as the Office of Management and Budget on grounds of duplication of service and cost.
- Develop an integrated network under NCIC control, proposed by the Justice Department. This plan is opposed by the OTP on the grounds that the majority of information being transmitted is state information and, therefore, should be left to the states. It is also opposed by the Domestic Council on the Right of Privacy, he said.
- Develop an integrated network under NLETS control. With this plan further equipment upgrades would be needed to give uniform service throughout the 50 states.
- Develop an integrated network under a new third-party control. This would require legislative authorization and only postpone the control issue, Beddome said.
- Divide the country into two regions with NCIC providing service to the eastern region and NLETS to the western region. This system would be bound to cause a fnnding nightmare, Beddome noted.
- Develop a network requiring little or no management. This sounds attractive, but according to Beddome, the plan would, in time, raise questions concerning new users, new uses, system discipline and probably the funding agency, LEAA, would have to determine who holds the *de facto* power to manage the system.

City, IBM Sued For No-Bid Lease

CW West Coast Bureau

INGLEWOOD, Calif. – A resident who claims this city has illegally installed IBM computer systems without competitive bidding is suing both the city and IBM.

George F. Gerard, a former candidate for city council, alleged in a Superior Court suit that the city has leased an IBM 370/135 and peripherals for 5380,000 a year without obtaining bids. Gerard claimed the city initially approved the negotiation of a lease for not more than $2,500 a month with IBM in 1967.

That system, a 360/20, was subsequently upgraded to a 360/25 before the leasing of the 370/135 two years ago.

A city hall spokesman said the city council approved each upgrading but did not feel it had to go to competitive bids because it was upgrading and leasing a system. The council has subsequently attempted to get competitive bids for the purchase of a computer system but rejected all three bids it did receive because it did not consider the number of bids sufficient to make a decision. The bids were from IBM, Xerox and Digital Equipment Corp.

Only IBM met all the specifications in the bid, and the council felt it should have other bidders who meet the specifications, the spokesman said. Another effort to obtain bids will be made, he said.

Gerard, in his suit, is seeking the return of all municipal funds paid to IBM with interest. He has claimed the specifications finally offered by the city were unfairly drawn in favor of IBM.

Form Contracts From Suppliers May Have Legal Deficiencies

BOSTON – Legal deficiencies in some of the printed forms which suppliers of computer equipment and services insist on using force their customers to resort to letters and other written statements to guarantee performance.

These deficiencies especially important "if litigation should be unavoidable," Roy N. Freed, a Boston-based attorney who specializes in contracting for computers and DP support services, stated in a recent interview.

If suppliers "refuse to deviate" from printed forms, a user should not underrate the value of covering important negotiations by letters to representatives of suppliers, he said.

"Complete negotiations" are important, he stressed, "regardless of the ultimate form the agreement will take in writing."

Freed also cautioned users against being "lulled into a sense of security because a particular supplier traditionally backs up its products," since this often happens "only by considerable nagging."

"A smoother relationship well might be secured if a number of commitments were reduced to writing" by contract or letter, he noted.

"Suppliers with bad performance records must be forced to place a wide range of commitments in writing, backed by effective remedies," he said.

With respect to remedies, Freed said "assurances of performance are of primary importance" and "money damages are significant only to the extent that they contribute to those assurances."

Of course you should.

The EDP Seminar Series gives you the information you need to keep ahead of this fast-changing industry.

We've selected leading experts from around the country to give seminars on some of the most important topics on today's EDP scene. These seminars are current, practically oriented, and packed with detailed information. They will help you save time and money. And they can give you the information you need to increase your installation's efficiency. In an increasingly complex and fast-changing EDP world, these seminars are even more important to your company, your installation, and you. Here is our current seminar schedule:

Data Communications

Bachelon SDLC, HID-LeD, and other topics that weren't even heard of a year ago.

Data Communications is a complicated and rapidly changing field. And this seminar will give you the information you need to keep on top of the subject. Led by the nationally recognized teleprocessing consultant, Dr. Dixon Doll, the course covers recent changes in areas like SDLC, HID-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers and specialized carriers.

The course will also cover general data communications topics, including intelligent terminals (performance and selection criteria), network software handlers (e.g. CICS) and network organization and design. And, you'll learn about saving money using such innovative concepts as split-stream modems, remote-multiplexers/concentrators, diagnostics for fault isolation and front-end processors.

All participants in this seminar will receive a 2-volume loose leaf outline of all course materials (prepared by ICC Institute), a copy of "Data Modems Selection and Evaluation Guide" by Vess V. Vilips and a "Data Communications and Teleprocessing Dictionary."

You should attend this seminar if you are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field – or if your company will be going into this area in the near future.

This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule is as follows:

Los Angeles	Los Angeles Marriott (Airport)	January 13-14
New York	St. Moritz	January 27-29
New York	St. Moritz	February 10-11
Chicago	Hyatt Regency O'Hare	June 2-3
Washington, D.C.	Stouffers National Center Inn	June 9-10
Los Angeles	Los Angeles Marriott (Airport)	June 16-18
Orlando	Travelodge at Lake Buena Vista	July 2-3

Contracting for Computers and EDP Support Services

A seminar that can help you protect your EDP investment – and your system.

In an industry that's famous for its "promise them anything" attitude, you need good, effective contracts from the vendors that supply your installation. And this seminar gives you the information you need to get them. It will show you how to protect your installation from late deliveries, inadequate equipment or services and the costly disruptions that they can cause.

Course topics include the lease and purchase of computer systems, separate hardware and software – the purchase of time sharing, data processing services and consultation – and the use of facilities management.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author and expert in the field of computer law, you'll learn how to place yourself in a strong bargaining position, how to insure on-time delivery of exactly what you want, how to set reasonable performance standards for warranties – and much more. You'll also receive a complete resource notebook, including *sample vendor contract forms.*

You should attend this seminar if you are involved in the purchase of EDP equipment or services, whether as a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm.

Cost for the entire 2½ day seminar, including complete resource notebook, continental break fasts, luncheons and coffee breaks is $295.00. The current schedule:

Los Angeles	Los Angeles Marriott	January 15-17
Chicago	Hyatt Regency O'Hare	February 26-28
Atlanta	Stouffers Atlanta Inn	April 23-25
New York	St. Moritz	June 4-6

Key-to-Storage Systems

How to evaluate and optimize the various successors to keypunch equipment.

Data entry is a big problem – and a big headache – as every computer user knows. It is therefore a prime target for cost savings. This course is designed to help you in the practical aspects of selecting, installing, and making the best use of keyboard-to-storage systems. It is an expansion and an update of our successful key-disk seminar. Under discussion (including some user case studies) will be:

- Introduction to data entry concepts (keypunch, buffered keypunch, keypunch, key-disk and beyond . . .)
- Key-disk hardware and software
- Evaluating . and starting . . key-disk systems
- Selecting and operating intelligent terminals, both key-to-cassette and key-to-floppy disk
- Key-disk as a remote batch terminal
- Supervisor functions; motivation
- Mixed Media systems
- Trends in Computer Data Entry

This seminar is lead by Lawrence Feideiman, President of Management Information Corporation, and one of America's leading experts on data entry. All participants will receive a copy of "Data Entry Today", Management Information Corporation's authoritative publication on every aspect of data entry, including a six-month update of this continuing reference service.

You should attend this seminar if you are concerned with optimization of your data entry shop, and especially if you are considering or currently using key-to-storage systems more advanced than basic keypunch. Cost for the 3-day seminar is $350, including continental breakfasts, luncheons, and all course materials. Additional registrants from the same company are charged only $300.

Los Angeles	Sheraton Inn (Airport)	February 3-5
New York	Waldorf Astoria	April 21-23
Chicago	Hyatt Regency O'Hare	June 9-11

Data Base Management

A practical approach to the design and implementation of data base systems.

The difference between an effective data base system and a waste of computer time and memory lies in effective planning, system selection and management. And this course gives you both the information and the basic experience you need for the proper design and implementation of a data base system.

Given in association with Leo J. Cohen and Performance Development Corporation, this course covers a comprehensive list of topics, including:

- *the description and definition of the Data Base System Project.*
- *the development of a full-service analysis and system design*
- *optimum file organization and indexing techniques.*
- *all available indexing techniques and their implementation*
- *all aspects of system management* + and much more.

One of the key features of this course is the workshops, in which you'll apply what you've learned. And before you're finished you'll have "done" a complete, on-line order entry / inventory management system.

You should attend this seminar if you are (or will be) involved in the design and implementation of a data base system – whether as a DP Manager, Data Base Administrator, Planner, Analyst or Programmer.

This course runs for 3 days, and costs $350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule:

Boston	Sheraton Boston Hotel	February 10-12
Los Angeles	Los Angeles Marriott	March 3-5
Chicago	Sheraton O'Hare Motor Hotel	May 12-14
New York	The Plaza	June 2-4

Operating Systems and Virtual Storage

A seminar on more efficient operation of your computer system.

Large installations now expect many programs to run simultaneously and efficiently. And that's what this 2½ day seminar is all about. Under the leadership of Dr. Ivan Flores, author of 14 books and one of the world's most prolific writers on systems software, you'll gain an excellent technical knowledge of your operating system, OS and VOS. The course uses the IBM/370 as its subject computer, because of its popularity, and includes these topics:

- Overview of Operating Systems
- Hardware aspects of Operating Systems
- Job Management
- Task Management
- Data Management
- Virtual System Philosophy
- Virtual Hardware
- Virtual Storage Operating Systems

Everyone involved with operating systems can benefit from this seminar. Programmers can employ its lesser known features. The manager can choose an operating system and options to handle his installation more efficiently. The chief operator can understand what's happening and better manipulate the system. The executive can determine the requirements for his plant.

Cost for the entire seminar, including course materials, luncheons and continental breakfasts is only $295. Current schedule: New York February 3-5

St. Moritz Hotel

THE EDP SEMINAR SERIES sponsored by COMPUTERWORLD

To: Ed Bride, Vice President, Editorial Services, Computerworld
797 Washington Street, Newton, Mass. 02160

Please send me a brochure and registration form for the following seminar(s):

Title	City in which you would probably attend.

☐ Many of our seminars are available for private, in-house use at a greatly reduced per-attendee rate. For full information on bringing any seminar to your facility, check here.

Name_____

Title_____

Company_____

Address_____

City_____ **State**_____ **Zip**_____

Phone (_____)_____

NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Marcia Hewett at (617) 965-5800.

Editorials

Unsound Proposal

The recent proposal of the Society of Certified Data Processors to license and regulate people in data processing is a bad one and should be rejected by all members of the computer community.

Unfortunately, however, the idea may have a simplistic appeal to some legislators with little understanding of DP as they are confronted by stories of "computer goofs" and "computer fraud."

A "Reader Commentary" on Page 12 outlines many of the reasons why this proposal is ill-advised, but firm opposition to this measure will be needed by all people in DP in order to beat back the idea.

The proposal has been sent to many state legislators and has been introduced in Massachusetts for possible action.

Computer users will have to keep a careful watch on activities within their own states and communities to insure that a small group does not force its views on local lawmakers and through them on all in the DP business.

Beware the Blitz

Some of the general press coverage of the recent antitrust suit brought against AT&T has served to distort the real meaning of the government's action.

In the days immediately following the first announcement of the suit, many articles talked about this ill-timed action in terms of current economic conditions. These same articles warned about the losses that might befall AT&T stockholders and how the suit would only lead to higher rates for phone users in the long run.

We don't know whether Bell is guilty and we won't presume to predict the outcome of this legal proceeding. But we are ready to congratulate the government for having the courage of its convictions, no matter how trying the times.

The fact is that the Justice Department has been working on this case for years. It has received vital documents from many firms within the data communications community which have allegedly been hurt by Bell practices. Modern suppliers, long lines customers and specialized common carriers all understand the reasons behind the suit.

It is bad enough that all Bell subscribers will have to subsidize the publicity dollars that will be spent by AT&T to gather public opinion on its side.

Hopefully all publications will report objectively on the case as it unfolds, despite the Bell publicity blitz. We certainly plan to do so.

The Year to COM

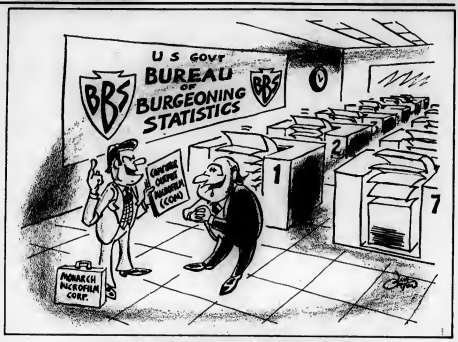
The year 1975 may well see computer output microfilm (COM) gaining wider acceptance in the computer community.

That prediction has been heard more than once before, but the factors forcing increased acceptance of COM have been mounting steadily.

Paper costs are growing dramatically, as are the salaries of computer operators who are needed when long, time-consuming print runs are being made.

At the same time, the cost of COM equipment has come down in comparison with the pioneering days of its use.

Clearly there are some significant savings possible with the use of COM, and all users will have to take a closer look at such equipment during the coming year.



'No Sir, Not the SAME Output in ONE-FOURTH the Space — I Said FOUR TIMES the Output in the SAME Space!'

Letters to the Editor

Pendulum's Swing Dampened By Separating God and 'Number'

Why pretend that God and "numbers" are incompatible? That art and "numbers" are mutually exclusive? Of course, both Robert S. Barton and Donald Knuth [CW, Nov. 20] know better. But what they said sounds as if they do not.

There is need for man to be artistic in his use of science, to be pragmatic while being imaginative and to be ethical in his use of numbers. There is no need to suggest that one side of man should exclude the other.

Because the western world's use of numbers to describe quantity and relationship was so bad when Sputnik was first launched, we set out to correct this shortcoming. No doubt there has been an overemphasis in the intervening 20 years. Now two men, Knuth and Barton, are calling for some dampening of the pendulum swing.

OK! But carefully, carefully! .

W.L. Kelly

Somerville, N.J.

No Substitute for Experience

Most of us who make up what *Computerworld* refers to as the computer community would like to be able to gain six years of experience without giving up more than five minutes of our time. Glenn N. Graham gave us such an opportunity in his article, "Installing MRP: How to Do a One-Year Job in Six" [CW, Nov. 6].

It was a well-written article, clearly meant to educate and advise those who otherwise might make the same mistakes. CW did well to publish the article but used less than good judgment when it printed Mickey V. Anderson's letter of rebuttal on Nov. 20.

Not only was the letter offensive and in poor taste, but it added little of value.

Experience, good experience, is a record of mistakes that one acknowledges and from which one benefits. It would not have been easy to find a DP manager with MRP experience six years ago to advise Graham, as so many currently good DP managers were then in school.

Graham is obviously not given to braggadocio or he would have concentrated on a presentation of the fine results of his six years of effort.

E.L. Kurowski

Chicago, Ill.

APs May Yet Be Used Effectively

M.J. Viehman's commentary on associative processors (AP) [CW, Nov. 20] seems more an attack on the intended uses or advertised uses of one system than a discussion of potential applications for such processors. It may be that such processors can be effectively used.

As one example, admittedly given without a thorough analysis, imagine an AP used as a peripheral processor on an I/O channel, assigned to perform a sort task. A program on the central processor would initiate a sort operation in the AP.

Through various tricks of configuration, the AP would be allowed access to data on that channel and, in theory at least, could read data in one order and read out (associatively) in another, thus effecting a sort in the equivalent of two passes through a data set.

Let us for the moment ignore the technicalities of implementation and ask whether such an application itself would be worthwhile; much of the computing world's activity seems to include the sort operation.

Similar (and more thorough) explorations may find useful applications for associative processing. The technique should not be ruled out in such an offhand manner.

B.A. Stevens

New York, N.Y.

Stampings Could Come In Handy

The other day I took out my trusty flowcharting template and for the nth time began to redraw another version of a routine I have in the works.

It occurred to me how much faster and easier it would be to draw charts almost perfectly the first time if I could get hold of the parts of the template that were punched out and slide those symbol shapes around a few times before attempting to draw a chart.

I'll bet all those nice symbol-shaped stampings are just thrown out. Now, if IBM, Control Data Corp., Univac or Burroughs could tell me how I could get a few pounds of those symbol-shaped stampings, I would be exceedingly grateful.

Stuart H. Rosenthal

Broadcast Data Base, Inc.
New York, N.Y.

A Faulty Omission

In my letter of Nov. 27, the second sentence in the last paragraph should have read:

"But despite the preventive nature of the Bell interconnection policy and the difficulty in isolating the harms, we have provided a substantial amount of information to the FCC on harm and to the National Association of Regulatory Commissioners (Naruc) during its recent investigation."

Paul Petrotta
Press Relations Supervisor

AT&T
New York, N.Y.

(Other letters and commentaries on Pages 9, 10, 11 and 12.)

Eclectic Remedies May Be Best Medicine for IBM Ills

By Sander Rubin
Special to Computerworld

Joe Wright's defense of IBM [CW, Nov. 20] seems pretty shallow. The issues in the antitrust action are important enough to warrant a more subtle analysis.

Wright asserts that IBM's dominance is noncoercive and therefore benign. He also assumes, without examination, that IBM's position has been achieved without unfair marketing tactics.

Maybe he's right, but that is to be determined by the forthcoming trial, not by the assertion of an ideological position.

The facts of IBM's growth, dominance of the industry, unusual profitability and liquidity are self-evident on the surface. In the same issue in which Wright's commentary appeared, Alan Taylor called attention to another fact: IBM has been consistently behind its competition in bringing innovations to the market.

The paradigm of our competitive system says that what one man can invent another can copy, and given time and fair competition the leader's position will erode. That hasn't, apparently, happened in IBM's case, and therefore it is legitimate to question whether fair competition exists in the industry.

Thus, and quite rightly, we are to have a trial in which these issues are to be exposed and examined. We have no better method for conducting such an inquiry.

Wright takes a wholly idealistic position (and I think therefore erroneous or even dangerous), stating, for example, that any customer can throw out IBM if the company defaults on its commitments. The real world is more complicated than that, and there are many practical constraints on the freedom of action of the various parties.

The spokesman for the Computer Industry Association and the Justice Department trial staff have been trying to come to grips with this reality by looking at the details of doing business with IBM and the other vendors.

It is not a matter of abstract morality or of looking for evil-intentioned men or of punishing IBM. The people responsible for IBM's success have already been amply rewarded, and no one contemplates any retroactive punitive measures unless specific and individual illegal acts are proven.

But apart from how we got here, we are where we are, and certain important questions arise. If IBM has been skimming the rewards from others' innovations, will there be incentive for continued innovation? If IBM has amassed overwhelming liquid reserves instead of distributing profits to stockholders so that anyone who plays on its turf does so only at their sufferance, who will provide the competition to keep it "honest?"

And are there dangers in allowing such great economic power to remain in the hands of a small, self-selected and private body of men? Does excellence in one area, marketing, lead to deficiencies in other areas such as design?

The tedious and expensive trial process is the way to expose the details needed to try to obtain realistic answers to these kinds of important questions.

Better Set of Circumstances

Even if Wright is wrong to leap to conclusions about the benignity of IBM's dominance before the facts have been examined, he does, tangentially, raise an important point. It is one thing to analyze the present situation and show it to be unfair or unsatisfactory; it is another and more difficult thing to synthesize a new and better set of circumstances.

From the reports of plans to break up IBM, whether horizontally or vertically, one gets the dog, barely barking, grabbed about for so long in the details of making a strong case, the Justice Department has relaxed into a broad-brush idealism when it comes to conceiving remedies.

Breaking up IBM will have one good effect; it will force the components to treat seriously the establishment and publication of industry-wide standards, an area in which IBM has acted cavalierly.

Competition is a valuable tool for spurring an industry to greater efficiency, more innovation and lower prices, but it is not at all a panacea. Five or 10 little IBMs would probably remain dominant in their respective sectors of the industry. The offshoots would undoubtedly inherit the management and product style of their parent.

Little Help

Artificially creating "competition" among little IBMs is unlikely to provide that diversity of options that a dynamic economy should have. Indeed, the IBM management style might not work well in a situation of forced competition.

Historically, that style has brought dominance and has failed, notably in the case of RCA, when employed in a situation for conformity to industry standards, to provisions for early disclosure of any of its developments which might affect those standards and to compulsory cooperation with other parties in the setting of standards, as long as IBM remained dominant.

- Bringing back IBM management to a world of reality and not permitting it to paper over mistakes with a blanket of cash. A more liberal policy for the recycling of IBM's earnings should be enforced.

First, the company should be far more openhanded to its stockholders, but solely increasing the dividend would only create windfall income to relatively few and would not do much to return funds to the industry that generated them.

A corollary, if complicated, procedure might be as follows. A public benefit foundation would be set up to receive a portion of IBM's earnings. The management of this foundation would be completely divorced from IBM's management. The foundation would be allowed to spend its income on good works or to invest it in the equity securities of any enterprise except IBM. In particular, it might be encouraged to invest in potential competitors to IBM.

- Using injunctions to protect areas of the DP industry in which IBM does not operate extensively and which enjoy a healthy, competitive atmosphere (such as minicomputers) from the threat of future IBM penetration.

Wright's suspicion of government regulation is not ill-founded. The people who make these regulations are, all too often, idealists like himself who seek salvation in simple solutions based on a single principle.

There really is no good substitute, however, for attention to detail and eclectic remedies.

Reuben is the owner of Wordworth Systems in Redondo Beach, Calif.

Reader Commentary

tion of contention among equals. At worst, IBM is not an unmixed curse, and it is not wise to discard even small blessings by pursuing an idealized principle of competition.

Careful Mix

The government's case against IBM probably has much merit. Its value will be lost, however, if the remedies are inappropriate. Rather than a single, all-encompassing formula, what is needed is a careful mix of detailed measures. Here are some possible components of such a mix:

- Bringing injunctions against certain practices which are found to be unfair.
- Subjecting IBM's practices to the review of a commission consisting of representatives of government, the DP industry and users of DP equipment if IBM holds more than 50% of the market.
- Subjecting IBM to special procedures benefits as well as problems when exercised from the position of single-firm

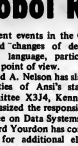
Cobol Reform Will Be Political, Not Technical, Job

Recent events in the Cobol world have evoked changes of deficiencies in the Cobol language, particularly from the user's point of view.

David A. Nelson has slashed away at the activities of Ansi's standards technical committee X3J4, Kenneth P. Seidel has emphasized the responsibility of the Conference on Data Systems Languages while Edward Yourdon has concentrated on the need for additional elements to avoid error-prone coding.

Each of these men has made some very good points, but one of the major criticisms made of them has been the failure to take advantages of some even good activities on the part of various sections of the Cobol establishment.

The Taylor Report
By
Alan Taylor, CDP



Codasyl is taken to task, for instance, for killing the EXAMINE statement, for poor and ambiguous writing, etc. But the inclusion of a collating sequence after it had been voted down in the appropriate committee meeting is not mentioned, nor are the horrors of communications.

In parallel, X3J4's arrogance in depreciating user investments by removing old legal usages from the new standard is mentioned – but not the action of both X3J4 and X3 itself in first delaying the necessary and promised audit routines from 1968 until 1974 and then dropping them altogether from the standard.

This failure to take aim at the faulty procedures is particularly unfortunate because there are many good ideas coming up from the Cobol radicals. They are, however, simply good technical ideas, while what is currently needed are good new political ideas aimed at making Cobol more responsive to the mass of Cobol users.

The reason for this probably is the failure of most Cobol technicians and users to recognize what Cobol is and what it is not. One can argue that Cobol is the language seen in manuals, but that is as restrictive as saying that a computer program is defined by reading its output.

Cobol does not exist without the various organs of the Cobol establishment and Cobol-watchers must therefore study just what these are as well as what they say. In brief, Cobol is a political entity, as well as a technical one.

To understand the political reality of Cobol some history will be helpful. Cobol exists, as it always has, as a political "orphan" which, by definition, acknowledges no real parent or owner.

Practically, of course, it has a parent or two. Grace Hopper and Univac are the real parents. Hopper helped create the language while Univac funded it; Univac users proved its credentials.

This all happened before 1958 and the problems of bringing the first Business language (B0) into existence.

In retrospect it appears as though Hopper had been preparing for the delivery of Cobol to the technical community for years. Programmers trained in her labs were strategically located in competitive firms and in the shops of major customers, particularly government installations. And she established a firm relationship with what was to become the necessary foster parent when the natural parents bowed out; in other words, the Department of Defense.

In 1959 all was ready. Alternative, competitive English language programs were published. The need for some action to cope with program conversion, even by hindsight, was clear in the Pentagon. All that was needed was the second natural parent.

This turned out to be Bob Bemer, then with IBM. His new English language compiler had just lost its name as the result of a trademark and copyright search. The yellow and black manual had no name on the cover, although the selected name, "Commercial Translator" (Comtran), was well known.

It was a good language too, one of the best of the competitors to B0 on technical grounds. This was perhaps because it was a simple language, with few identifiable gimmicks built in to show off some technical feature of the operating system or hardware.

However, the technical strength of the various languages was not the important matter then, and Bob realized this as much as Hopper had. He took his own precautions by making, for instance, a hurried trip to London to put his case before the European computer manufacturers and then waiting for the correct time to arrive.

The time arrived in September 1959, when it became obvious that neither Univac nor IBM would permit the recognition of any language that one possessed but which the other did not. The fate of both Univac's B0 (by then renamed Flowmatic) and IBM's unbaptized Comtran flickered between the ephemeral existence of a single-company language and the glow of universal existence without any strong parentage.

So strong indeed was the competition between the two computer leaders, and so confident was each management that it could beat the other given an equal start, that the idea of acknowledging some other parent became more attractive politically.

Cobol was actually born when Bemer agreed with Hopper to suggest accepting the next manual that arrived *before* the technical people had time to look at it and raise any objections they had based on company priorities.

The manual that did arrive – that they knew was coming – was the Honeywell Fact manual, from Dick Clippinger. Later, even Fact's contribution was to be played down, but its arrival permitted the technical arguments to be temporarily outflanked. And allowed Cobol to be born through politics and political savvy, based on political realities. Now we need Cobol to be reborn. It already has had a bewildering number of foster parents and guardians in its history. Now is the time for the emergence of new guardians to guide it through its adolescence.

Neither X3J4 nor Codasyl fit the bill as they are presently constituted, so the technical arguments must be used only to show that failure – while some political planning is done to find their successors.

Good luck to anyone trying the political job. Hopefully the technicians will support you when the plan is revealed.

Letters to the Editor

The Education Dilemma

Proper Curriculum in DP Should Include Economics

With regard to the current discussion on George Glaser's speech (CW, Nov. 6) about the "odd couple," I wish to add a point of view not yet in evidence: computer science is science, not more and not less, and data processing is economics.

Computer science, therefore, has little reason to train business DP people beyond pure programming skills which, in some instances, they do quite well.

A course in assembler level coding which I took at the University of Colorado gave me sufficient training in the art of programming and the technical side of data processing to provide one-third of the necessary tools for a competent programmer: hardware and programming proficiency, knowledge of business and economic analysis.

A proper curriculum in DP, I believe, would, in addition to this sort of course, be heavily centralized in pure economic analysis and, in fact, would be ideally considered the practical application of such theory in the world of business affairs. I say this because economics is concerned with the allocation of scarce resources in the face of unlimited demand, which also happens to be the problem faced daily by analysts, programmers and operations people.

The models studied in pure micro- and macroeconomics analysis also lead one to the awareness that one does not operate in a vacuum and that psychological and political factors, not the least of which is the invasion of privacy, are easily as important as the pure technical excellence of a system.

If we add a liberal dose of business courses such as quantitative methods, accounting and personnel practices, including sufficient operations research and theory to design network-based systems, it is my belief graduates would find ready acceptance in the world of business DP. The rough and tumble of life in the average economics department approaches that of business and is excellent training for that environment.

Matthew L. Jonerka
Redlands, Calif.

'Antiintellectual Sniping' Blurs Needs of Profession

Have we not had enough antiintellectual sniping from those such as George Glaser and Rogert Hoberman [Nov. 27]?

What, may I ask, is the point of all this? It sounds suspiciously like the self-serving protestations of those worried about their own qualifications in their chosen profession.

Why, one might wonder, are they drawn to corny, self-dramatizing metaphors about "street fighting?" Who is to say which is the "real" world?

What does Hoberman mean when he says, "Few computer science graduates are properly prepared to deal with broad applications problems, particularly those that are people-related?" Ignoring illiterate constructions like "people-related" what possible proof can Hoberman have? This kind of argument is gratuitous nonsense.

(Continued on Page 11)

Letters to the Editor

'Antiintellectual Sniping' Blurs Needs of Profession

(Continued from Page 10)

Are these people aware that much compiler optimization is based on something as "impractical" as graph theory? Do they understand that to predict the performance of a sorting algorithm requires a certain amount of mathematics.

I fail to see how any manager involved in a field as complex and expensive as the computer business can waste his time penning ad hominum nonsense about education. Surely all possible aid, from whatever quarter, should be welcomed.

It is particularly alarming to hear this sort of prattle from the president of the American Federation of Information Processing Societies (Afips). Perhaps Glaser has the wrong job.

Jonathan C. McCormick

New York, N.Y.

But it is not a mistake to emphasize the theoretical for those students who will go on to graduate school and into research. Note that the curricula for that type of student are the most viable, or publicized, because they are at the "best" schools.

Furthermore, even in those schools catering to the job-directed majority, it is desirable for the curriculum to stand slightly to windward. The university cannot teach the truly practical as well as industrial experience can, but industry cannot teach the underlying principles as well as the good, experienced professor can.

So the optimum curriculum should be balanced between theory and practice, in the light of the available faculty, the available computing resources and the educational objectives of the students.

I doubt that business school professors are any better than computer science professors at hitting that balance point. There are good and bad in each camp, and the business school people have their hang-ups too.

We have two computer-oriented curricula at Indiana University of Pennsylvania, one in computer science and one in business systems analysis. The two are even beginning to cooperate and allow students to minor in each other's curriculum.

Each of the two faculties believes its program is the better one to educate students to go out into computer-oriented jobs in industry and perform well. In truth, it depends on the particular student's capabilities and on his job objectives.

The formal demands (as to knowledge of computing) are higher in computer science, but the knowledge of business practice demanded is greater in Business Systems Analysis.

We think the world needs both types of graduate, and we know our computer science graduates can compete effectively for jobs and be highly praised by employers.

H.E. Tompkins
Chairman
Computer Science Department
Indiana University of Pennsylvania
Indiana, Pa.

Back to Basics?

The editorial, "Theory Just Not Enough," makes a good point.

Fortunately, what was talked about was the difference between science and engineering, so at least we don't have to reinvent the wheel to solve the problem.

W.L. Burkhard

Chicago, Ill.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Uniform Education Demand Ignores DP Job Diversity

The comments of George Glaser regarding computer education received front-page billing. While such comments and suggestions serve to improve the response of educational institutions to the needs of industry, two impressions were given which I believe to be false.

First, universities are not the only educational institutions providing new entrants to our field. The four-year colleges, the community colleges and the technical institutes are all active in this field. Each responds to the student in a different way and provides industry with a different type of employee.

The second assumption was that industry requires and seeks a uniformly trained employee. This ignores the diversity of job opportunities in the typical DP department.

Please let the universities continue to provide researchers and teachers. If they don't, who will?

Perhaps *Computerworld* or Afips could investigate both the diverse job requirements and the diverse educational opportunities. Then hammer away at all of us, not just the universities, if we fail to meet these needs.

Roderick McMillan
Computer Science Department
St. Mary's College
Winona, Minn.

Attempting a Balance

The editorial "Theory Just Not Enough" [CW, Nov. 20] and George Glaser's speech both contain grains of truth, mixed in with great gobs of attention-grabbing but misleading generalization.

Yes, many (but not all) computer science programs emphasize the theoretical at the expense of the practical, and that is a mistake in those colleges and universities where most of the students go right into industry after graduation.

SCDP Has 'Sold Out,' Deserves ICCP Condemnation

By Ron Stewart
Special to Computerworld

As one member of a group of concerned DP professionals which was responsible for the establishment of the Institute for Certification of Computer Professionals (ICCP), I have a strong feeling of being sold out by the Society of Certified Data Processors (SCDP) and its president, Kennison W. Lord Jr., after reading about the legislation it drafted to license DP professionals [CW, Dec. 11].

A good number of those people who worked toward the creation of the ICCP did so believing that voluntary certification was the only practical and acceptable *alternative* to licensing – not a first step toward licensing or one small part of the licensing process.

In proposing a licensing process, SCDP has sold out the ICCP by taking an action in direct opposition to the avowed objective of ICCP. As SCDP is a charter member of ICCP and Lord is a member of the ICCP board of directors, I believe its action should be immediately and publicly condemned by the ICCP and the possibility of a censure action discussed by the other ICCP member organizations.

If no public statement is forthcoming, it must be assumed that the SCDP licensing position is in agreement with the long-range goals of the ICCP. It might then also be predicted that the ICCP will be seeking to establish itself as the license-testing authority, thereby assuring itself of a piece of the revenue-producing licensing pie.

Make Position Clear

To make its position clear, bold and prompt action is necessary. Unfortunately, ICCP has a track record of avoiding any action at all. In the 15 months since the incorporation of ICCP, the only actions visible to the outside world have been the assumption of responsibility for the Data Processing Management Association's certification program and the elimination of the Registered Business Programmer (RBP) certification program. Hardly an impressive record of accomplishment from the public viewpoint.

ICCP has been beset by problems . . . some internal difficulties, a critical lack of funding to make the organization truly viable, a lack of action in opposition to licensing, no public position on the privacy issue (which has become closely tied to the certification/licensing issue), etc. However, the time for action is Now, not next year.

ICCP must be heard from or consider closing down its operation.

Though I will oppose the SCDP licensing proposal, SCDP is at least facing the current issues and speaking out. I wish the same could be said for the ICCP.

It is unfortunate that the time and energy expended by Lord and the SCDP could not have been directed toward the revision of the ill-conceived privacy legislation which is being ground out at the federal and state levels of government. I consider myself a strong supporter of protecting and preserving individual rights, but after studying some of the proposed legislation (including the Ervin and Koch bills) I can only characterize it as inadequate, unspecific and, in some cases, over-restrictive enough to drive some smaller organizations out of the DP business.

I can fully understand the lack of interest in the short-comings of proposed privacy legislation on the part of the computer/software industry – it has little to lose and possibly quite a bit to gain in increased sales of "computer security" software and in increased sales of equipment and software to keep track of accesses to individual records.

I cannot understand the overwhelming apathy of the computer practitioners, the computer societies and especially the business community to both the privacy and certification/licensing issues.

There are a few industries that have spoken out – the beleaguered retail credit people are very vocal and the American Life Insurance Association has submitted a position paper to the appropriate government committees.

Finally, I cannot believe that those name DP practitioners who have steadfastly avoided voluntary certification have suddenly been convinced that mandatory licensing is acceptable. And licensing is mandatory; by definition it is the authorization to carry on one's chosen profession.

It is time for the individual programmer, systems analyst, manager, etc. to speak out and let his professional society know where he stands. (A society's role is not only to lead on important issues – it also must reflect the attitudes of its membership.)

Write to *Computerworld*. Write to me. Let us all know your wishes and concerns. These issues can affect your profession and your livelihood, and if Lord and SCDP have their way, it could be soon!

Stewart is systems vice-president of Globe Life Insurance Co. in Chicago, Ill.

Reader Commentary

'He Died From an Overdose of Data'

Dear Computerworld:

☐ PROUD
☐ SKEPTICAL
☐ ANGRY
☐ PLEASED
☐ INVOLVED
☐ AWARE
☐ CURIOUS
☐ EXCITED
☐ DEMANDING
☐ FURIOUS
☐ INFORMED
☐ SURPRISED

☐ ALL OF THE ABOVE

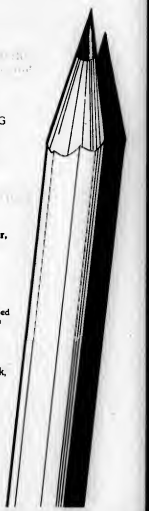
☐ **I'm already a subscriber, but I'd like you to change my:**

☐ **address**
☐ **title**
☐ **industry**
☐ **other**

My current mailing label is attached and I've filled in new information on the other side.

Please fill out form on back, detach and insert in post-paid envelope attached through binding. Thank you.

COMPUTERWORLD



RATES: U.S. - $12 Canada and PUAS $20 Other foreign - $36

If charge we must have cardholder's signature

First Initial	Middle Initial	Surname
Your Title		
Company Name		
Send to: Address		
City	State	Zip Code

Address shown is
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*

10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other

Detach here, fold, and place in post-paid envelope attached through binding.

$11,340/Mo 'Saved' on 158

Monitor-Based Study Pinpoints OS/VS2 Tuning Gains

By Don Leavitt
Of the CW Staff

NEWPORT BEACH, Calif. – Avco Financial Services has one thing in common with a lot of DP shops; a management that wonders how much could be saved by careful tuning of the operating system.

But Avco has one thing a lot of DP shops don't have: answers.

As a result of a study utilizing a Tesdata Model 1155 hardware monitor, completed early last summer, Avco senior systems programmer J. Frank Chambers told his management $11,430 could be "saved" each month by altering the way OS/VS2 Release 1.6 was being used.

This "savings" could be realized, Chambers explained, by modifying Avco's use of three basic areas within the operating system. The changes would provide a 12.7% performance improvement and since the installation (including a 2M-byte IBM 370/158) has a monthly cost of $90,000, he said, the gain is equivalent to a savings of $11,340.

The study itself, which was presented to a recent meeting of the Tesdata Users Group, followed conventional lines by identifying the instructions that represent a large fraction of total CPU usage.

This approach to improving the performance of a program having a high CPU demand is justified in two ways, Chambers maintained. If a performance degrading error has been made, it should show up as an area of code executed quite frequently.

If a change is to make a significant improvement in performance, it has to be made in a section of code that has a significant share of the executed instruction time.

Nucleus Studied

Most studies consider application programs, but the "program" Chambers studied was the nucleus of the operating system itself. Areas of significance were identified through an instruction-frequency histogram developed from the monitoring data, and the study concentrated on those areas of code that exceeded 3% of the total execution time.

Once peaks of utilization were recognized, Chambers felt the code responsible could be analyzed in the hope of identifying routines controlled by outside parameters – such as those in the parameter library Parmlib – or routines that could be deleted without adversely affecting the system operation itself.

Monitoring of Avco's 2M-byte 370/158, with 3330 disk support, took place during prime time – 8 a.m. to 6 p.m. – on four separate days in late May and early June. At times, total CPU utilization was as high as 88%, Chambers found.

Supervisor activity was responsible for 60% of all the CPU utilization and this realization led to the closer study of eight modules in particular. Some of these, however, managed capabilities so basic to the system they could not be touched.

Others were more accessible. The System Event Tracing module, for example, accounted for more than 12% of all CPU time but is "truly optional," so Chambers turned it off through changes in the Parmlib, even while the study was underway. That caused a 7.75% performance improvement, he noted.

The facility is still in place, Chambers noted, and can be reactivated whenever debugging runs require its use.

The System Management Facilities (SMF) counting routines accounted for 4% of the total nucleus, activity, the system programmer said, and elimination of those operations – once again, through Parmlib entries – resulted in a 2.3% performance improvement overall.

Chambers begged off from making any specific recommendations in connection with the timer element dequeuing routine, noting "any change in the CPU utilization caused by this routine (3.9% of the total nucleus' activity) must be accomplished by changes in the problem programs responsible for requesting this supervisor service."

The CCW Address Translation, Type I SVC Exit, Dispatcher Exit and I/O Interrupt Handler routines are all executed in response to the need for a block of I/O data, and account – as a group – for 40% of the nucleus' activity. The number of I/O events can be reduced by increasing the size of the I/O blocks, Chambers said, admitting however that no data had been collected during his study on the size of the blocks then being used by the application programs.

Despite the lack of specific information, he ventured that "if the average block size could be improved 10%, a 2% savings in CPU cycles can be realized."

'Sara' Summarizes Performance From Data Collected Under SMF

DOVER, N.J. – Managers of IBM 360/370 installations can determine how well computer capacity is being utilized by accessing System Analysis and Resource Accounting (Sara) software now available as a package from Boeing Computer Services (BCS).

Sara puts out information accumulated from standard Systems Management Facilities (SMF) data collected on tape during OS-based operations on the user's own CPU. The user-selected Sara reports complement those produced by hardware or software monitors, but Sara can be used effectively by itself, according to BCS sources.

The Sara reports, in tabular or bar-graph format, are designed to meet the differing needs of analysts and programmers and of both middle and top management. The technicians, for example, can review series of reports displaying allocation and use of system resources by device class and invidual component.

Generally, actions for middle management are often suggested by a series of reports which typically isolate job stream effects on system resource usage. These identify bottlenecks created by job resource contention, identify peak load conditions and display the demands an application makes on the system, BCS said.

Finally, summary reports are included to support top management's analysis of a computer system's effectiveness and efficiency, both of which are key capacity metrics, BCS pointed out. Other summaries also provide data on multiprogramming and single-stream performance, total component usage and indications of the impact on overall system operations caused by schedule changes.

Sara is written in Fortran and supports operations run under MFT 21.6, MVT 21.6, OS/VS2-1.6, the time-sharing option (TSO) or Hasp-IV environments.

Object code, two days of on-site support, and informal training are included in the basic Sara package for installations operating under MFT or MVT for $5,500. VS support module is available for an additional $1,000; Hasp support is another option, although BCS has not yet established a price for this capability.

BCS can be reached through P.O. Box 708, here in Dover, 07801.

'Dcrabs' Speeds DOS Disk Tasks

JACKSONVILLE, Fla. – DOS and DOS/VS installations can handle disk file backups, Isam file reorganizations and conversions of files to other disk types with the Disk Copy Restore and Backup System (Dcrabs), according to the vendor, Generic Systems, Inc. (GSI).

The utility is said to support all DOS disk types: 2311, 2314, 3330 and 3340. It can be used under one of the operating systems or in stand-alone mode – a useful feature in the event of a system failure, a spokesman noted.

Faster and more flexible than IBM's free disk utilities, according to GSI, Dcrabs allows the user to save files (by moving them from disk to tape), restore (from tape to disk) or copy (from disk to disk) a "wide range of disk structures."

Entire packs, active portions of packs, sequential, direct access and Isam data files, and private and system core are among the target structures that can be handled, GSI said, as are the relocatable, source and procedure libraries.

Isam file handling is stressed by GSI. Whenever an Isam file is rebuilt, it is reorganized and the user may choose, at his option, to create or delete the master index, to alter the blocking factor or to change the cylinder overflow specification.

Whenever a library is rebuilt under Dcrabs, it is condensed, GSI said. It can be recreated as a unique facility or merged with another library.

To illustrate the speed of its utility, GSI ran a test during which a full-pack source statement library was saved by IBM's OS Dump/Restore in 40 minutes and condensed by IBM's Maint in 2-1/2 hours. Dcrabs saved the library in 2 minutes 45 seconds and restored it, condensed in 3 minutes 20 seconds, GSI claimed.

Dcrabs is available regardless of the number of CPUs or installations for a single charge of $1,500.

GSI is at 8282 Western Way Circle, 32216.

Bill of Material Based on S/3

FLUSHING, N.Y. – IBM System/3 users operating under Release 11 of the control program software can generate bill of materials lists or determine the amount of chemicals required to make up variable quantities of predefined formulas with a multilevel explosion routine now available from Memcomp Systems.

Running in 9K of memory, the routine uses keyed-in formulae or product names as search arguments against a disk-based item master file. Once the item is found, the desired quantities are used as multipliers against the unit quantities carried in the file, Memcomp explained.

When match-ups are made and needed quantities of the subcomponents or chemicals are calculated, the results are put out on a line printer. Written in RPG II, the Memcomp coding functions well but does not check for internal looping, the vendor admitted.

Source code for the routine is available for $500 from Memcomp at 131-45 37th Ave., 11355.

GCC Offers Singer Software

MACEDONIA, Ohio – Singer System Ten users apparently now have a new source of application software: General Computer Corp. (GCC).

Payroll, accounts payable, accounts receivable and general ledger packages are available and can be installed under either DMF 1.5 or DMF 2.0.

The accounts receivable (A/R) system is designed to accept data from three sources. Manual entries are intended for initial start-up as well as entry of non-trade receivables.

The user's invoicing system may be used to update the A/R file; cash and adjustment posting can be used to apply changes to the A/R file.

The payroll system is a multiple company system designed to handle various types of pay frequencies and calculations. Input to the system is accepted via CRT terminal.

Output includes edit listings, checks, check register, payroll register, deduction reports, distribution reports, time cards, 941As, W-2s and an employee list. State taxing routines can be changed and/or added by the user following a method designed by GCC.

The accounts payable system is designed to disburse checks to vendors and to distribute invoice amounts to the proper accounts. In addition, a cash requirements projection for user-specified intervals aids in financial planning.

The general ledger package has the ability to interact with the payable and the accounts receivables systems.

The payroll and payables packages sell for $3,000 each, the A/R and general ledger for $2,000 each. GCC can be contacted at Box 185, 44056.

System Catalog Data Added to 'Disclose'

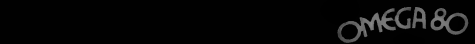
CAMBRIDGE, Mass. – As an extra-cost option, systems catalog data can now be included along with reports of data set utilization generated for OS and OS/VS installations by the Disclose survey system from Programart Corp.

Disclose now surveys the system catalog and the volume table of contents (Vtoc) on direct-access volumes and produces both systemwide and volume-by-volume reports of storage allocation.

Three system-level reports are produced. One provides an alphabetical listing of data sets on any selected group of volumes or in the system catalog.

Two other reports list the tape-resident data sets cataloged in the system.

Developed by Computer System Architects, Inc., Disclose with system catalog support costs $725, which covers both source and object programs on tape and documentation. Basic Disclose, without the system catalog feature, can be purchased for $450 from Programart at 133 Mt. Auburn St., 02138.



OMEGA 80

An investment in the future.

It took foresight to put the development and perfection of a product like Omega 80 ahead of costs.

Because in the long run, costs are always nominal when a product meets a growing need. That's the case with Omega 80. It's designed for high-speed, high-density digital recording.

Its recording/reproduction range is from 25,000 FRPI to as high as 80,000 FRPI.

The materials and technology used to produce this new medium are so advanced, it will be years before Omega 80's potential is even challenged.

But with a life expectancy of up to 100 years, an investment in Omega 80 is a solid investment in the future.

Omega 80. $30 per reel.

GRAHAM MAGNETICS
Graham, Texas 76046

New 'Common Language' Urged as Cobol Replacement

By Marcel J.P. Devaud
Special to Computerworld

Cobol has no future and even its present is dubious.

Cobol was designed to become a high-level language; instead, it became a higher level of technical jargon. The syntax has remained so specialized and rigid that only a trained programmer can understand and utilize it.

Concepts and Techniques

Implementors have always designed their own compilers and added their own language extensions to best suit their hardware and operating system characteristics. The American National Standards Institute (Ansi) is still working on the semantics of Cobol.

Meanwhile, implementors are continuously adding more marketable features to their compilers, yet rendering the language more fragmented.

Cobol was developed to fulfill two goals: to be an English-like language and to be common to many computers.

Slowly these goals proved unrealistic.

The hardware, increasingly more powerful, is made of AND, OR and NOT gates structured into functional modules. The software, increasingly more expensive, is made of a plethora of words poorly assembled. Selecting fewer words and arranging them intelligently would increase software effectiveness.

Now that technology has put the power of a first-generation computer on a single chip, designers are working to develop a layman's language that would eliminate the need for specialized computer dialects. Slowly it is becoming clear that nonprogrammers can store, process and retrieve information from remote terminals.

Clerks, airline agents, salesmen and managers have already established their shop talk with the computer and its data base. Soon more and more users will be submitting their problems directly to the computer rather than to the programmer.

Consequently, the design of a *user-end language* is more attractive than the restoration of some Cobol compilers.

Cobol is not and will never be suitable in a man-computer dialog. As a programming language it is too unwieldy for developing the system software which could process a dialog. Even when used in a more traditional environment, Cobol still ignores structured syntax and has no data base support.

Any afterthought about Cobol brings:

- The gathering of improvement requests from concerned users.
- Many Codasyl and Ansi meetings.
- A common interpretation of the resulting language by all implementors.
- A redesign of many compilers.
- A reprinting of all Cobol manuals.
- A programmer's reeducation.
- An exorbitant conversion at the user end.
- The redesign of many Cobol pre- and post processors.

Today such a project is no longer financially profitable.

Picture if you will: We are in the late 70s, and a large monolithic Cobol program designed back in the early days of the IBM 360 has to be maintained (and debugged). The code first written in Cobol E was soon modified to Cobol F, then converted to Ansi 68, later updated with some IBM Version 4 improvements and optimized for VS, to finally be structured and reconverted to the Ansi '74 standard. (Note we skipped the Ansi '74 conversion).

Is this elaborate piece of software worth its cost? Can it be transported to other hardware? How efficient and how reliable is it? Will a Future System still accept it?

Fresh Start

The multitude of Cobol programs in existence today must necessarily remain until one by one each traditional application is turned over to the next software generation (late 70s). Meanwhile all Cobol compilers should be stabilized at their current level. The language of the future cannot be built on the bones of Cobol; any tendency in this direction would be a waste.

The energy saved by refraining from further dead-end Cobol enhancements could more profitably be used to design a common programming language (CPL) of the future.

First a distinction should be made between programming language and user-end language. The programming language is used by programmers for developing supportive software, as opposed to the user-end language which is used by the layman in his dialog with the computer.

The main objective of a CPL should be: portability, superior replacement for existing languages and simplicity with limitless growth potential.

The primary objective of CPL is to be common to many machines. Cobol did not achieve this goal mainly because implementors had to write their own compilers. A common interpretation of the language could be secured if we gave the compiler to the implementors instead of an incomplete language description.

Portability Possible

An independent group of users would design the original CPL compiler. The technique is to write CPL in CPL; the compiler can then generate itself, thus producing a compiler for any machine. Portability would be possible between large-scale computers and minicomputers as well.

Portability also means that programmers can write programs without having to know the internals of each machine, and programs are debugged at the source level rather than the machine instruction level.

Until now computer systems have been developed from the inside out. To be effective future systems will have to be designed from the outside in, as James Martin noted in his recent *Design of Man-Computer Dialogs*.

The experience gained in the past by using high-level languages such as APL, PL/I, Fortran or Cobol will serve in the design of CPL.

The main objective is that at all times the programmer (and not the compiler) must remain the controlling element.

The ease with which man communicates with the computer will determine the extent to which he uses it, to cite Martin again.

CPL syntax must be concise and logical (mathematical). Its learning should be gradual; simple functions could be learned in a few minutes while more complex usage might take several months of experience.

Now that machines can process man's knowledge, the programmer's creativity should not be restrained by his programming language.

Devaud is with technicol services, EDP and telecommunications services, Blue Cross Association, Chicago, Ill.

Data Briefs

Western Union Offers 1,200 Bit/Sec Data Set

MAHWAH, N.J. – Western Union Data Services has added a Bell 202C-compatible 1,200 bit/sec data set to its product line.

The company said it will install the integrated data set as an option on those terminals equipped for 1,200 bit/sec operation. These terminals include the EDT 1200, plus the EDT 33, 35 and 300 with magnetic tape cassette buffers.

The solid-state asynchronous modem is designed with all electronics on removable cards for simplified diagnostics and maintenance, according to the vendor.

Monthly lease costs for the data set are $21 in a manual originate configuration, $25 with automatic answering and $30 with a 5 bit/sec reverse channel. The modem can be obtained from 70 McKee Drive, 07430.

Programmable Switch Available

HAUPPAUGE, N.Y. – An automatic real-time data communications line switch, said to be fully programmable without software, is available from Multiplex Communications, Inc.

The switch is solid state and operates using a stored macro-instruction programming set called Firmware. All connection, signaling, routing, logging and diagnostic abilities are directed by Firmware.

The automatic switch interconnects from 10 to 256 lines. It can be used as a local telegraph switching exchange, a data line concentrator or as a local data system.

The switch can also function as a computer line switch, time-share concentrator or as a real-time circuit switch.

The basic 10-line system is available for less than $13,000. Systems with 100 lines are less than $500/line. Delivery time is four to six months from 123 Marcus Blvd., 11787.

Alphanumerics Added to Vistar

BURLINGTON, Mass. – Infoton, Inc., a subsidiary of Optical Scanning Corp., has added an alphanumeric CRT display terminal to its family of Vistar terminals.

A stand-alone device designed for a range of applications, the Vistar/2 transmits at 12 selectable rates up to 9,600 bit/sec and features dual intensity and protected data, the company said.

The terminal is connected to systems via standard EIA RS-232C Interfaces and 20 or 60 mA current loops, the firm added.

Displaying 24 lines with 80 char./line, the Vistar/2 also includes direct cursor addressing, vertical tabbing and a remote keyboard.

The base price is $2,395 from the company at Second Ave., 01803.

In Light of Antitrust Suit

Bell Hard-Pressed to Maintain Hard Line

By Ronald A. Frank
Of the CW Staff

NEW YORK – The antitrust suit filed by the Justice Department against AT&T and the Bell System could have beneficial effects on communications users, regardless of the final outcome.

The initial reaction of AT&T's Chairman of the Board John D. deButts indicated a hard line approach to the government charges. At various press conferences deButts gave assurances that the Bell System would continue its present policies and that the telephone companies would operate in a business-as-usual manner.

But industry observers feel Bell will be under severe pressure to take a more lenient attitude in several areas. Even before the Justice Department suit, there were about 20 other civil actions pending, all of them dealing in some way with Bell System marketing practices.

Serving the Public

The central issue in these actions in somewhat simplified form is whether the offering of telecommunications services to the public is more economical and beneficial when restricted to a regulated monopoly. While AT&T takes pains to convince public opinion that there are inherent advantages to "natural monopolies," its hold on various sectors of telecommunications has been eroding since the late 1960s.

The foremost proponent of increased competition has been the Federal Communications Commission, which established both the specialized common carriers and the interconnection of noncarrier equipment as major new challenges to Bell.

Both of these areas have given com-

Analysis

munications users a choice of offerings for the first time. In each case the new participants had innovative and less costly options, many of which were not available from the telephone companies.

As a result, the Bell System became more responsive to users' needs. AT&T offered equipment that might not have been introduced for years if there had not been competitive pressures and other service choices for users.

At the time the suit was filed, AT&T was under court order to cooperate with the specialized carriers in providing Bell local loop facilities, and AT&T was giving indications that it was ready to agree on more liberal interpretations of its interconnection requirements.

The Justice Department suit is primarily directed at Western Electric which supplies most of the equipment for the telephone network. The suit implies that by restricting this equipment to the Bell System other suppliers cannot operate on equal terms. It also suggests that it would be in the public interest if this equipment were available to non-Bell suppliers and customers.

Ironically, an independent Western Electric may be the secret goal of Bell's long-range battle plan. Although AT&T carefully avoids use of the word in describing its central office equipment, its central office equipment bears a striking resemblance to large computers. It would not be too hard to envision Western Electric as a new major mainframe supplier, "reluctantly" forced into this role by the courts.

And a large supplier like Western Electric might be a logical contender to give IBM a run for its money in the future.

In the short term, both users and vendors that feel threatened by the restrictive practices of the Bell System companies will be encouraged by the government's suit. Just as the Telex suit spawned other similar legal actions, AT&T will now be fair game for those who have been holding back.

In its day-to-day operations, the telephone companies will find it difficult to continue the deButts hard line. As one industry source said, "Every operating company vice-president will have to evaluate his actions for fear of becoming a party to the suit."

For the user, increased service choices together with a more responsive phone company seems like a good package. And in answer to the deButts threat of higher phone rates resulting from the antitrust suit, the average subscriber can only wonder what else is new.

9,600 Bit/Sec Modem Operates On Unconditioned Private Lines

BURLINGTON, Mass. – Intertel, Inc. has introduced a 9,600 bit/sec data set that is said to operate on unconditioned private lines.

Called the MCS9600, the modem can operate on 9,600 bit/sec dial-up lines for backup, according to a spokesman. The unit can operate in point-to-point and multipoint nets at speeds from 1,200- to 9,600 bit/sec. It can also handle multiplexed lines to mix 7,400-, 4,800- and 7,200 bit/sec data rates in multipoint nets "without any hardware or software modification" to the CPU or front end, the company said.

Elimination of conditioning on Bell private lines could save the user about $30- to $40/mo under current tariffs, but most experts believe the line would need good signal-to-noise and harmonic distortion parameters to run at 9,600 bit/sec.

The MCS9600 includes noise filtering and equalization techniques that reduce signal distortion within the data set, the company said. Because of this, the filtering and equalization can be devoted to improving the line quality.

The data set includes analog and digital loop-back test capability as well as bit error rate testing. LED indicators include a good, fair or poor receive signal quality display and also include monitors for five signals on the RS-232 interface.

The modem costs $9,700 or $250/mo on a two-year lease. The cost on a three-year lease is $240/mo and maintenance is extra at $32/mo regardless of which lease plan is chosen. Intertel is at 6 Vine Brook Park, 01803.

Inflation Outpacing Salaries

NEW YORK – Salaries in telecommunications areas are continuing to climb but not as fast as the pace of inflation in general. This is one of the findings in an annual survey of jobs in telecommunications issued by Personnel Resources.

During 1974 growth continued for domestic satellite and specialized common carriers with most of these firms adding new employees, the survey said.

National averages for message switching programmers ranged from $13,000 to $16,000, while senior telecommunications systems programmers generally earned between $15,200 and $18,700, according to the survey. Analysts with some data communications experience earned from $14,700 to $18,200, while communications directors generally were paid between $18,700 and $26,100.

Employment is now "much better than it was during the 1970 recession" because most companies have few extra employees, the report said. The complete survey results are available from Personnel Resources, 342 Madison Ave., 10017.

Bright New "Screen Star"

"Your debut has been a sensation. To what do you attribute your success?"

Hazeltine 1200:

"Good Breeding. I'm the latest in a long line of outstanding performers."

"But there are others who claim to be as good as you are. Could you be more specific?"

Hazeltine 1200:

"Take character for example. I have 1920 of them. 80 across and 24 down. Not only that, I'm available with switch-selectable baud rates in any combination of two standard rates all the way up to 9600.

"My options—such as upper and lower case, current loop and others—make me adaptable so that I can play to several different audiences."

"But Great Performers like you usually demand a high price. What do you have to say about that?"

Hazeltine 1200:

"Well! That's one of the other reasons for my success. I give people the features they want and need, at a price they can afford—only $65 a month, 12-month rental, maintenance included."

"How do you fit in with the other members of your family—the Hazeltine 1000, the Hazeltine 2000 and the Hazeltine 3000? How does your success affect them?"

Hazeltine 1200:

"Each of us is talented in different ways. But of course we all share the advantage of a worldwide sales and service network backed by more than a half-century of leadership in electronics and displays."

"I know that you're in great demand. Where will you be appearing next?"

Hazeltine 1200:

"That's up to my agents in Hazeltine sales offices throughout the world. A phone call at any time is all that's required to arrange for a personal appearance."

Hazeltine Corporation

Computer Peripheral Equipment, Greenlawn, N.Y. 11740 (516) 549-8800 Telex 96-1435

East: N. Y. (212) 586-1970 ☐ Boston (617) 261-5867 ☐ Phila. (215) 676-4348 ☐ Pittsburgh (412) 343-4449 ☐ Wash., D.C. (703) 979-5500 ☐ Rochester (716) 254-2479
Midwest: Chicago (312) 986-1414 ☐ Columbus (614) 868-5111 ☐ Detroit (313) 559-8223. *South:* Dallas (214) 233-7776 ☐ Atlanta (404) 393-1440
Houston (713) 783-1760 ☐ Orlando (305) 628-0132. *West:* San Mateo (S.F.) (415) 574-4800 ☐ L.A. (213) 553-1811 ☐ Denver (303) 770-6330 ☐ Seattle (206) 242-0505

'Dash' Dashes Off Daily Updates Of In-House Telephone Directory

By Ronald A. Frank
Of the CW Staff

NEW YORK — For many companies the maintenance of an in-house phone directory can be annoying. But one company, Warner Communications, Inc., has called on a specialized terminal system to simplify the job.

The key to automating the phone directory is a customized software program combined with Sanders Data Systems CRTs to access a data base containing information on 1,200 in-house telephones.

The software program, called Directory Assistance Handling (Dash), was developed by Marketing & Systems Development Corp. and adapted for operation on Warner's 370/158.

The Sanders 8170 CRTs are installed in the Warner telephone center and when an operator receives a request for an extension number, the first three characters of the person's last name are entered onto the terminal's keyboard. The request is then transmitted on-line to the Dash data base stored on a 3330 disk subsystem.

CW Photo by Ronald A. Frank

LaVerne Kowalchuk enters inquiry into Sanders terminal while Don McCormack, Warner communications director, watches.

The CRT then displays the person's full name, extension, department number and job title or other data that may be required. If more data is needed by the telephone operator, a "continuation record" can be called up that includes information such as an alternate extension in case of a busy, the person's secretary, employee number, etc.

Savings Seen

The main advantage to the new system is a savings in the cost of maintaining the directory, according to Don McCormack, corporate communications director. Before switching to the new system, Warner used a manual operation that required clerks to update the phone listings as employees moved or phones were changed. Often a Warner crew will come to New York in connection with the shooting of a film or some other temporary assignment, McCormack explained, and these people must be listed so they can be located easily.

"Before, it took one person a week each month to keep the directory up to date, and we would issue an entire new directory every six to eight weeks," he said. Now the directory can be updated in less than a week, while under the manual system it took about one month to make a change, McCormack said.

Instead of the manual updates, the daily changes are now entered each morning on the terminals and the data base is corrected before the start of the business day.

As updates are needed, the 158 system generates a print tape of change pages that are required for the loose leaf directory. This print tape, prepared on an IBM 3420, is then input to a Xerox 1200 printer which generates the new pages.

Implementation of the Dash system represents a cooperative effort between the Warner DP and communications departments, according to Raphael De La Sierra, corporate assistant vice-president. He sees the data base as the first step in other applications that could include personnel records and insurance claims files among others.

Early next year Warner intends to add a toll recording system that monitors call usage of each line on the Warner Centrex system. When this system is operating, the output records will be overlayed with the Dash data base. This will combine the calls per line together with the departments using the lines. The resulting data will be the billing information needed to charge telephone usage to the responsible department, McCormack explained.

The Dash system was installed in about 60 days on the 158. It is written in Cobol but has a Fortran subroutine. The system will operate on 360/370 CPUs with CICS systems running under either OS or VS software. Minimum configurations are a 360/30 or a 370/135 and average Dash storage requirements are 16K to 24K for "normal" applications.

The software is designed to run with Sanders terminals, and the Warner installation is one of the first to use the Sanders 8170 displays. The CRTs operate in remote mode to the DP center in the Warner building, according to Nancy Lounsburg and Pio Enriquez, systems programmers who helped to implement the Dash system.

The terminals are connected to a Sanders 810 terminal controller in the DP center. The controller inputs the Dash data into an IBM 3704 front end which is operating in 2701 emulation mode under Btam, Enriquez said. The Sanders CRTs operate at 2,400 bit/sec and emulate IBM 2260 terminal inputs to the CPU.

The Dash system costs about $15,000 plus installation from Marketing & Systems Development, 1180 Raymond Blvd., Newark, N.J.

Terminal Transactions

Smaller Audioport Out

WINDSOR LOCKS, Conn. — Transcom, Inc. has introduced a more compact version of its portable alphanumeric audio response terminal.

Acoustically coupled and battery operated, the Audioport-116 is a 16-key audio response terminal that utilizes dial-up telephone lines to communicate with a central computer. The company characterized the device as a smaller version of the Audioport-160.

With 10 numeric and six special characters of the Touch-Tone code set, the 116 is said to be compatible with all major audio response systems. A built-in speaker with volume control permits hands-free operation, and the response may be heard by a group in addition to the operator, the company noted.

Priced at $185, the 116 will be available for delivery in January from 500 Spring St., 06096.

Terminal Transactions

Market Takes Aim at Inflation With Automated Checkout

ROCHESTER, N.Y. – Shoppers at a Wegmans market near here now have purchases tallied by a terminal checkout system that eliminates the manual ringing up of many items by the cashier.

Installation of the IBM 3660 supermarket systems began in November, after a demonstration model gave consumers an opportunity to become familiar with its features.

"The productivity and control improvements promised by these automated checkstands have the potential to help fight inflationary cost pressures that originate from operational expenses," said Robert B. Wegman, chairman of the Wegmans board. Wegman is a member of the food industry's ad hoc committee, which developed the Universal Product Code (UPC), the basis for machine-read prices.

The pilot installation is being introduced to shoppers as Accu-Ring, according to Mary Ellen Burris, Wegmans director of consumer affairs. "The name was selected by members of a consumer advisory committee who worked with us for several months before installation," she said. "They felt that accuracy was the single most important consumer benefit offered by the new system."

The consumer advisory committee included nine women, representing a variety of ages, family sizes and occupations.

The consumers and key store representatives studied the checkout system and its potential benefits to shoppers. The group also recommended the demonstration model, appropriate educational materials for in-store use and a customer comment sheet.

Nine sales terminals are each equipped with a scanner to replace nine conventional cash registers.

The supermarket terminal includes a high-speed printing unit to produce a descriptive sales receipt, which Wegmans calls the Tell-Tape. This name was chosen by the consumer committee to emphasize uses of the receipt for menu planning, budgeting and comparison shopping. The receipt information includes product description or department, taxable items, total tax due, coupon credits, date, time of purchase and checkout lane.

Initially, approximately 70% of items on sale at Wegmans carry scannable symbols. Those not source-marked by the manufacturer before reaching the store are being labeled by store personnel. Those not scannable will be entered manually by the checkout clerk.

"Shoppers will be able to check accuracy for themselves," Burris said. "Wegmans plans to continue to price-mark all merchandise with a conventional stamp or sticker, and this price can be compared with the one scanned and read by Accu-Ring."

The decision to retain conventional price-marking was made last summer after evaluating a company-conducted study which analyzed the dollar cost of price-marking. This, combined with customer concern about inflationary price increases, led to the policy to continue price-marking all merchandise.

Incoterm Increases Display Prices 5%

NATICK, Mass. – Incoterm Corp. has announced prices increases of 5%, effective immediately, covering all its display products. Prices for spare parts and selected peripheral products used in conjunction with the CRTs have also been increased.

The company said it had partially absorbed inflationary cost pressures through increased productivity and selected price increases on peripheral products and maintenance. But recent increases in the cost of materials and labor now require an additional price adjustment.

Register Terminals Feature Store and Forward, Mag Tape

MAYNARD, Mass. – Dacap Datacomm, stand-alone electronic cash registers, were introduced by Data Terminal Systems, Inc.

The communication terminals capture and store register transaction data and transmit this information to a DP center.

Dacap 42, 70 or 98 registers become communications terminals by adding Ans-R-Tran, Ans-R-Tran with an electronic store and forward or a magnetic tape recorder, a spokesman said.

Ans-R-Tran links a Dacap register to a Bell data set for unattended remote reporting of all register totals to a DP center. All data is transmitted over dial-up telephone lines.

Ans-R-Tran features 300 bit/sec or optional 110 bit/sec transmission, 8-bit asynchronous characters and Ascii- or Ebcdic-compatible codes.

By adding an electronic store and forward, up to 1,000 lines of information – such as payroll data, customer account information, stock numbers and inventory reorder data – in addition to all register totals can be transmitted with Ans-R-Tran.

For reporting of up to 60,000 lines of information and transmission speeds ranging from 300- to 1,200 bit/sec, Data Terminal Systems offers a magnetic tape recorder system. All data is recorded on a tape cartridge which can be mailed or transmitted over ordinary telephone lines from field locations to a DP center.

Also available is a data cartridge reader for applications where cartridges are mailed to a data processing center. The unit reads and then transmits recorded data directly into a CPU, eliminating the need for costly magnetic tape converters, the spokesman noted.

Excluding the price of Dacap registers, communications terminals start at $450 for an Ans-R-Tran system, $1,250 for Ans-R-Tran with an electronic store and forward and $2,690 for the magnetic tape recorder ($2,195 if cartridges are mailed). The firm is at 124 Acton St., 01754.

Control Display, Bell Added to Termiflex Units

NASHUA, N.H. – Termiflex Corp. has added the display of control characters and a bell for incorrect parity indication to its hand-held, TTY-compatible, alphanumeric interactive terminals. The features are available at no additional cost.

The company contended that the display of control characters makes the terminals more useful to field service, test and engineering users.

DP DIALOG

Notes and observations from IBM which may prove of interest to data processing professionals.

Milwaukee, which borders on Lake Michigan, as it looks after the computer has classified the different land use categories using the satellite data. The lavender areas are industrial; the red, older housing; orange, newer housing; light and dark green, agricultural and wooded areas; the blues, water.

Analyzing the Great Lakes Area from Space

Pollution of the Great Lakes—the largest body of fresh water in North America—continues to be a major concern to the governments of the United States and Canada. But new techniques are being pursued which can put a halt to the harmful pollutants now flowing into the lakes.

One of the best ways environmentalists can curb this pollution is to have information about the entire region showing how the land is being used. The trouble is, it would take years to prepare such data by conventional methods and by then some would be hopelessly outdated.

To tackle the problem scientists at the Laboratory for Applications of Remote Sensing (LARS) at Purdue University are using an IBM computer to help analyze multispectral scanner data taken of 82,000,000 acres of the Great Lakes region from a satellite orbiting the earth 500 miles up. The end result will be color-coded maps and statistical tables of each of the 191 counties in the United States with watersheds or water runoffs that spill into the Great Lakes.

"The U.S. Environmental Protection Agency will use these maps to pinpoint industrial and agricultural areas that may be causing pollutants to enter the lakes," explains Dr. Richard Weismiller, head of the Great Lakes project. "Once the sources are found, steps can be taken to minimize further pollution."

The official name of the project is The Great Lakes Pollution From Land Use Activities Study. It is a direct result of the Great Lakes Water Quality Agreement between the U.S. and Canada under the aegis of an International Joint Commission. The Commission will use the data gathered to evaluate the adequacy of existing pollution control measures and recommend remedial steps to be taken.

Remote sensing technology is not new in this country, but analysts have depended mainly on photographic data coupled with manual analysis. "With the advent of multispectral scanner systems in the mid-60's, we found there was a real need to find faster, more efficient methods for analyzing data," recalls Terry Phillips, director of data processing.

The answer lay in the computer, which could quickly analyze scanner data both from aircraft and later from space satellites. "Now data and computer-aided analysis techniques can be made available to any interested local, state or federal agency and to universities or industrial groups," says Phillips.

"In fact, we have trained other interested users to analyze our computer data themselves. We've installed terminals at six locations so they can use the data and the analysis techniques stored here in the Purdue computer any time they want."

On the Great Lakes project the scientists are working from data gathered by remote sensing devices located in a NASA-operated satellite called ERTS, Earth Resources Technology Satellite.

ERTS is essentially a flying observatory orbiting the earth every 103 minutes. It carries two independent sensors—one a camera system that is really three cameras in one. The cameras simultaneously photograph overlapping views of the same area segments, each one hundred miles square.

The other sensor is a multispectral line scanning device. It picks up the reflected energy of a scene in a line-by-line fashion. The optics of the system refract this beam of energy separating it into components according to wavelength.

The spacecraft can transmit the data to a ground station when it is in line of sight. Otherwise, it stores the information on tape for later transmission. In the United States there are three ground stations—in Alaska, California and Goddard Space Flight Center in Greenbelt, Maryland.

The data from all three centers is digitized at Goddard, which sends it to laboratories like LARS for analysis. Scientists at LARS run these scanner tapes against programs stored in its computer to generate either color images or printed statistical charts.

Dr. Weismiller believes the combined technology of the satellite and the computer offers us a chance to take a comprehensive inventory of our earthly resources. "The Great Lakes project is only one of many possible applications. We can now survey hundreds of thousands of square miles to identify regions of highly promising ore potential; map forests, determining types and volumes of trees in specific areas; make soil maps which sort out productive land from unproductive land; and determine such facts about the soil as iron content, organic matter and drainage patterns."

IBM

A Model Approach to City Planning in Oregon

Eugene, Ore., nestled in the green Willamette Valley of the Pacific Northwest, is growing at about five percent a year, and its 90,000 citizens want to keep its growth orderly. In developing new areas under their general plan, the city fathers don't want to exceed the boundaries already set for urban services, such as street networks and sewer lines.

Several computer programs using a System/370 Model 155 are currently being developed to aid in the analysis of proposed zoning changes, development proposals and planning studies. Data on each parcel of land is stored in the computer—ownership of the parcel, its assessed value, address, current land use and, for certain parts of the city, topography, soil type, vegetation and slope characteristics.

"By simulating different uses of land in the computer, we will be better able to predict what effects any change in zoning may have," explains John Porter, planning director for the city.

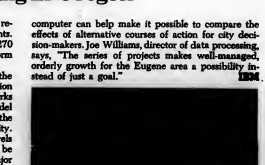
A plotter attached to the computer can sketch out any area of the city, from an entire downtown section to individual blocks or parcels. In addition to being able to specify certain geographic areas for data retrieval, the system can retrieve selected data elements. By initiating a job through remotely located IBM 3270 terminals, planners can obtain information in the form of printouts or plots.

The City Planning Department is not alone in the effort to develop a geographically-based information system and modeling techniques. The Public Works Department has implemented a sewer analysis model which has been used most recently to simulate the effects of population increase in one part of the city. The model is designed to compute, for varying levels of population, the amount of sewerage that must be carried by the remote collector lines through the major trunk systems to the treatment facility.

In another use of geobase modeling, traffic planners are completing environmental impact statements with the aid of an urban gas diffusion model. The system is able to predict emission concentrations at a given point based on such considerations as the street network and traffic volumes.

Through such geographic modeling projects, the computer can help make it possible to compare the effects of alternative courses of action for city decision-makers. Joe Williams, director of data processing, says, "The series of projects makes well-managed, orderly growth for the Eugene area a possibility instead of just a goal."

IBM



Geographic modeling helps planners determine if new housing subdivisions can be serviced adequately.

A comprehensive new approach to teleprocessing makes it possible for any terminal, on any line, to talk with any program in the computer.

Teleprocessing Landmark

As teleprocessing has evolved, so has the variety of terminals, line control methods and programming support—many of which are incompatible with each other.

A new development from IBM, called Advanced Function for Communications, is designed to expand communications capability and improve productivity. Available till now only for systems within specific industries, it combines new equipment and programming and uses System/370 computers under virtual storage.

This new approach applies a unifying design to an entire teleprocessing function. It permits users to move readily from one IBM terminal-based system to another with a minimum of application programming changes.

A single teleprocessing network is now available for many uses. The network can handle a broad range of multiple online applications. And terminals and equipment on any line can be shared by different applications.

For example:

- In manufacturing and process industries, remote sales offices and plants can share communications facilities and terminals for sales, order entry, production reporting, and finished goods inventory.
- A motor freight company can enter freight bills and, with the same terminal, do message switching and equipment control transactions.
- Railroads can combine yard reporting, waybill entry and demurrage accounting.
- In insurance offices, terminals can be shared for claim verification and policy endorsements.
- In banks, making changes on CIF files, calculating yields on bonds and entering data in the trust department can be done on the same terminals.

Advanced Function for Communications includes three major software elements: the virtual operating system itself; the Network Control Program (NCP/VS) resident in the IBM 3704/3705 Communications Controller; and VTAM, the teleprocessing access method for System/370 virtual systems.

A family of terminals and communications products—most using advanced Large Scale Integration (LSI) technology—is available for use with Advanced Function for Communications. All utilize Synchronous Data Link Control (SDLC), a flexible, more efficient line control method.

The latest members are included in the IBM 3767 Communication Terminal, the IBM 3770 Data Communication System, and new models of the IBM 3270 Information Display System. For the 3767 and 3770 systems, an automatic terminal identification capability, an optional security key lock and an optional magnetic stripe reader (operating under SDLC) offer safeguards against unauthorized use of terminals or access to data files.

Other IBM terminal-oriented systems that offer Advanced Function for Communications are the 3600 Finance Communication System, the 3650 Retail Store System, the 3680 Supermarket System, and the 3790 Communication System.

IBM

Computers and Mathematics Explore the Inner Ear

Close to 17 million people in the United States currently suffer from hearing problems. Of these, at least three million have severe hearing disorders due to defects in the inner ear or auditory nerve. Little can be done to correct or even provide some relief for this kind of deafness. The main problem is that specialists know little about parts of the inner ear called the cochlea, and inside the cochlea, the basilar membrane. This membrane, in particular, is not only hard to reach, but is so delicate that it's difficult to study without destroying it.

Over a century ago, the physicist Helmholtz came up with an idea for bypassing some of these experimental difficulties. He suggested that a mathematical description of the cochlea would provide important information. The only trouble was that Helmholtz was a century ahead of history—he didn't have all the experimental evidence he needed, and he didn't have the computational power of the high-speed computer.

Today, what Helmholtz had only dreamed of is being realized by specialists like Dr. Alfred Inselberg, a mathematician at IBM's Los Angeles Scientific Center. For 15 years, he has been developing mathematical models of the cochlea, first as a personal research interest, and later on as a full-time IBM project in collaboration with the Ear Research Institute in Los Angeles.

"We can generate a computer model based on the mathematical model," explains Dr. Inselberg. "We can then do experiments on the model that could not be done on the actual ear."

Dr. Inselberg holds a model of the inner ear used in anatomy classes at UCLA medical school.

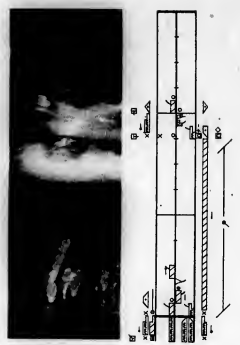
These experiments together with the mathematical analysis of the model have provided some important information. "We found, for example," says Dr. Inselberg, "that the ear's high-frequency threshold is determined by the properties of the cochlear fluids—like density and viscosity—and the elasticity of the basilar membrane.

"By contrast, the low frequency threshold depends on the shapes and relative dimensions of the cochlea and the membrane. From this, the nature of Meniere's disease—a kind of deafness characterized by ringing in the ear, where the lower frequencies are primarily affected—can be better understood.

"We also found that certain defects could—in principle—be compensated for by changes in various properties of the cochlea. For example, changes in the stiffness of the basilar membrane could be compensated for by changes in the viscosity of the cochlear fluids."

This kind of information is of great assistance to Dr. Inselberg's colleagues at the Ear Research Institute. They hope to use the model to diagnose the hearing defect. Then by experimenting with different approaches on the computer model, they plan to determine the best one to take.

IBM



Typewriter Element for Dance Notation

The illustration above is not an architectural rendering but a part of a ballet score typed with an IBM Selectric® typewriter. It tells the ballet master that a "bourrée avec port de bras" is what is most called for, or more simply, a graceful step across the stage with an upward movement of the arms.

These notes are written in Labanotation—a system developed by Rudolf Laban 45 years ago. In short, it is to dance what a music score is to music. Until recently, it had one serious drawback: the notator had to prepare the dance script by hand. This required the skilled hand of an artist, trained in Labanotation, who could render the symbols with proper emphasis and clarity.

In an effort to speed up the process, the Dance Notation Bureau of New York approached IBM to help find a way to reproduce dance notation symbols mechanically. Therein began a collaboration between a group of dancers and notation directors at the Bureau and a team of IBM engineers and type designers from IBM's Office Products Division.

The outcome was the development of a special ball-shaped typing element which, when used with a modified IBM Selectric® typewriter, permits the printing of the Labanotation symbols. The element contains 88 separate characters which can be arranged and built upon to form a complete vocabulary for recording movement of any kind.

A specially designed chart showing the position of the Labanotation symbols on the keyboard is used along with the element. As the operator types, she translates all movement to basic symbols.

The element permits the transcribing of both time and interrelation of actions, making it possible to indicate fine details of movement in quality and manner of performance. At the same time the system is adaptable enough to offer a broad, general description when detail is not wanted.

Herbert Kummel, executive director of the Dance Notation Bureau believes the extension of the system to electric typewriters is "just the first step in making movement notation more accessible. Without question it will facilitate the use of Labanotation in the 90 colleges and universities now teaching the method. By describing the movement and recording it mechanically we hope to make comparative studies in physiotherapy, athletics, anthropology and the behavioral sciences."

DP Dialog appears regularly in these pages. As its name suggests, we hope DP Dialog will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialog, IBM Data Processing Division, 1133 Westchester Ave., White Plains, N.Y. 10604.

IBM.

74-6

Bits & Pieces

Xerox Follows Pack, Ups Maintenance, Prices

EL SEGUNDO, Calif. – Xerox has increased prices on maintenance and most of its computer equipment by 8%.

The increase will not affect the purchase price of Xerox 530, 550 and 560 CPUs.

Xerox Sigma computers and their peripheral equipment, whether purchased or leased, and leased 500 Series computers will be affected by the increase. All computer maintenance services also will be increased by 8%, the company said.

The price increases are effective immediately for new business: For currently installed equipment, the new prices will became effective on the terminal date of lease or maintenance agreements, but in no case earlier than April 1, 1975.

Itel Announces Dual Port, Controller for 7330 Disk Drive

SAN FRANCISCO – Itel's 7833/7330 disk drive subsystem has a dual port capability that allows the attachment of two controllers and use of two drives simultaneously, boosting availability of data by up to 25%, the firm said.

Two 7833 controllers can be attached to each drive, and either controller can access any drive on a dynamic basis, the vendor noted.

The user can intermix the 100M-byte Model 7830-1 disk unit or the 200M-byte Model 7330-11 on the same 7833 control unit.

The disk subsystem is designed so that a disk unit failure disables only that one drive, leaving the remaining units in the subsystem string unaffected, Itel said.

The dual port option brings the cost of Itel's 7330 100M-byte disk unit to $24,480.

The 7833 control unit costs $85,000 for a standard two-channel, 16-drive unit with the dynamic switch addressing capability. The firm is at One Embarcadero Center, 94111.

Different Tape Formats Erased

LINCOLN, Neb. – The Model 70 continuous belt magnetic tape eraser can cleanly erase any 7-in. reel, cartridge or cassette in one pass on the belt, according to its vendor, Garner Industries.

About four seconds are needed for the tapes to travel the length of the belt and for previous recording to be removed, the firm noted.

The Model 70 costs $550 from the firm at 4200 N. 48th St., 68504.

Honeywell Delivers First 62/60

WALTHAM, Mass. – Honeywell has delivered the first Series 60 Model 62/60 computer to be installed in the U.S. to FAG Bearings Corp., a manufacturer of precision bearings in Stamford, Conn.

At Gulf Oil

Key-to-Disk Solves OCR Reject Problems

HOUSTON – In OCR processing of credit card invoices, rejects can sometimes amount to 10% to 20% of the data input. Since some OCR equipment does not have the capability to reprocess these rejects, some companies are turning to key-to-disk systems to key enter the correct data for computer processing.

The application at Gulf Oil Corp.'s Travel Card Center here is an illustration of this concept. By changing to a key-to-disk data entry system to reprocess OCR-rejected gasoline credit card invoices, the center has increased throughput of rejected data between 40% and 50% compared with keypunches used earlier. And verification throughput has gone up by at least 50%.

The center services a customer base of 4.5 million accounts with 1.5 million of these customers active in any given month. Out of the average 250,000 invoices which are processed daily, approximately 38,000, or 15%, are rejected. These are the invoices that must be handled by key entry equipment.

Gulf originally handled the reject operation completely with keypunch machines. The company then turned to a combination of key-to-tape units and encoding machines to do the job before ultimately installing three Inforex 1302 key-to-disk shared-processor systems, each with eight keystations.

Faster than keypunches, the key-to-disk systems have also proved themselves more productive than the stand-alone key-to-tape units, requiring neither additional pooling and merge operations nor extra tape handling, according to Perry Garrett, supervisor of data entry for the Gulf Travel Card Center.

Combining OCR, Key-to-Disk

The overall process by which data is captured and processed entails careful integration of OCR and key-to-disk techniques, he explained. Incoming invoices, which are grouped into trays and assigned a batch number and date, are passed through the scanner, which picks up optically identifiable data and transfers it to tape for the "good reads."

For those items that are mutilated or cannot otherwise be read by the scanner – the rejected invoices – the OCR system leaves gaps on the tape, identifying the space and missing data by tray, batch number and date.

In a separate operation, the data from the rejects is keyed through the shared processor onto the system's disk and then pooled with other rejects on a reentry tape. Each day the data from the reentry tapes is merged with the "good reads" on a disk file, filling the gaps in proper sequence within each batch by virtue of the identifications assigned at the time of rejection.

In a final operation, the data is balanced against summary cards from dealer invoices, Garrett said.

Gulf designates the procedure just described as its "numeric" operation. In addition to handling rejects from the OCR system, the numeric operation also takes care of data entry on special billing accounts, such as for fleet and government fuel purchases.

Another type of data entry, called the "alpha" operation at Gulf, is also performed on its key-to-disk systems. The alpha operation includes setting up all customer master records for new accounts, maintaining these master files and entering coded input for computer-generated customer correspondence, which is not possible with Gulf's OCR equipment, Garrett noted.

As in the case of the numeric operation, the figures for the alpha operation are impressive, he continued. A total of 1/2 million changes of all kinds are processed monthly, including 75,000 addresses. To handle this workload, operators of the key-to-disk equipment at Gulf are averaging production rates of 170 records keyed per hour and 200 records verified per hour.

Gulf operates its key-to-disk systems on two shifts, five days a week. Currently there are 24 keystations working in conjunction with the three 1302 shared processors. Although under normal circumstances 12 stations are devoted to numeric work and 12 to alpha jobs on each shift, this balance can be changed when dictated by work volume, Garrett said.

Shared processing units and the possibility of switching control of individual keystations from one to another unit make for added reliability as well as flexibility, according to Garrett. "System reliability has been very high, and the amount of maintenance required has been negligible," he added.

All data at the center is finally processed by either of the company's two IBM 370/145 computers. Installed just last year, these mainframe units have modernized and greatly increased the power of the facility, he noted.

Gulf uses several options available with its data entry equipment, including packed records, reformatting, tape validate and expand tape processing.

In addition, Gulf and Inforex devised a way to use the key-to-disk equipment to key overflow records, i.e., those more than 80 characters in length, without creating a second record on the disk. The system has been programmed to insert record marks automatically when the keyboard's AUX key is depressed. When used in conjunction with program level shifting, this procedure permits overflow records to be created, Garrett explained.

High-Tension Power Line Not Interference Threat: Siemens

MUNICH, W. Germany – Nearby high-tension power lines are not much of a threat to the smooth operation of a data system, according to researchers for Siemens A.G.

Company engineers were interested in this question since switching operations in a high-tension network or short-to-ground on a line can cause interference pulses in DP equipment, Siemens stated.

The researchers proceeded on the assumption that a computer should be at least 20 meters away from a 110 kV power line. They then calculated that a short circuit in the high-tension line at that distance would expose the DP gear to a magnetic interference field intensity of about 0.8 amps/centimeter (A/cm), which is far below the 40 A/cm specified as the maximum permissible ambient field intensity for magnetic data carriers, the company noted.

Even if the power lines were only one meter away, the interference field intensity would still be less than half the permissible value, the company noted.

The engineers also calculated that voltage pulses caused by switching operations at the terminals of the high-tension line would be in the region of 18 V, but since data cable screens reduce such faults to between 1/100 and 1/1,000 of their values, the voltages actually reaching the computer's circuits are less than 0.2 V. Pulses of this magnitude aren't a danger, Siemens said.

Pulses Tolerated

In a situation where there is a short-to-ground on a high-tension line only 100 meters from computer equipment, pulses of only a few volts would penetrate it. These pulses would be tolerated by circuits with differential inputs, Siemens noted.

However, the customary fault expectancy is about one case of short-to-ground per 100 kM of line per year, "which means that a short-to-ground up to 100 meters from the computer can be expected to occur once every 500 years.

Siemens noted that all the estimated influence values are on the safe tolerance side and that the screening effect of the building housing the computer was ignored.

Meet the world's most inexpensive video terminal.

The DECscope. $875 in quantities of a hundred.

We think it's time the cost of video came down to earth.

Because in a lot of situations, video is the most convenient way to access a computer. It's fast. It's quiet. And non-computer people find it easy to work with.

So we're introducing a video terminal at a budget price.

The DECscope.

It's not a fancy piece of equipment. It's simple, reliable, and easy to use.

The keyboard is the familiar typewriter-style arrangement.

The scope displays ASCII-standard uppercase characters, each on a 5x7 dot matrix for readability. After displaying 12 lines, the page scrolls upward from the bottom; its speed can be adjusted by the user.

We designed the DECscope for reliability, with few moving parts. The keyboard has been extensively tested, to deliver over 100 million failure-free key strokes. And the DECscope's low heat output means no fan, which reduces noise and eliminates messy filters.

The DECscope interfaces via a standard 20mA Teletype interface, or with an inexpensive EIA option for access to the computer over standard telephone lines. Baud rates are switch-selectable up to 9600, for most efficient use of lines.

Take another look at the price. $875 in quantities of a hundred. And think about what budget-priced video could do in your system.

Then act. Dial 800-225-9480. Toll-free from 8:30 AM to 5:30 PM Eastern time. (US only. Massachusetts residents, please dial (617) 481-7400, extension 6653.)

We're the Components Group of Digital Equipment Corporation, One Iron Way, Marlborough, Massachusetts 01752.

In Canada: Digital Equipment of Canada Limited, P.O. Box 11500, Ottawa, Ontario, K2H8K8. (613) 592-5111, extension 127.

In Europe: 81 Route de l'Aire, 1211 Geneva 26, Telephone: 42 79 50.

digital
COMPONENTS GROUP

Unbundling the world's most popular minicomputer systems.

Terminals Feed Into Three Centers

UK University Teaches 42,000 Over Telephone Lines

MILTON KEYNES, England – From its inception in 1969, Britain's Open University (OU) has recognized the computer as an indispensable educational tool for nearly all academic disciplines. So the university set out to build a computer network that today comprises three student computing centers and serves more than 10,000 remote students from 200 terminals located throughout the UK.

The OU is a government-sponsored institution dedicated to bringing a university education to anyone willing to study at home in spare time. The OU program demands no academic entrance qualifications and leads to a bachelor of arts degree after an average of five or six years of study.

Now in its fourth academic year, the university is teaching more than 42,000 students using an unconventional educational formula that includes correspondence courses, lectures via radio and TV broadcasts, some classroom instruction and the computing service.

Three identical computer centers are located in different parts of the country to reduce the costs of long distance telecommunication on public telephone lines. Students call up the nearest computing center and enter their data. If one system is not operational, students have access to the remaining two centers.

James Burrows, manager of the student computing service, said, "The Hewlett-Packard (HP) 2000Fs, like the 2000B systems they are replacing, can handle 32 users concurrently but offer additional disk memory. They have 23.5M-byte moving-head disk storage, a substantial increase over the B version's 2.4M-byte fixed-head disk.

The student at the terminal will probably not notice the transition from one system to another, but the upgrade is important to programmers who now have at their disposal main processors with 32K words of memory and front-end processors with 16K memory. This is twice the capability of the 2000B, Burrows said.

By switching to the 2000Fs, the centers also make twice the previous program area of 5K available to the students without their having to learn how to chain programs.

Can't Rewrite Textbooks

"It is essential for us to retain compatibility," said Burrows. "We have a big investment not only in money but also in documentation. With quite a number of courses off the ground already, we can't rewrite our textbooks every time we outgrow one computing system."

In all, about 10,000 students are taking courses which involve some aspects of computing: either a straight computing course, a mathematics course or a technology course where students may use the computer to model or simulate situations.

No dramatic increase in the number of students using the HP 2000F is expected at the OU. Rather, the steady 10% to 15% growth that was seen each year is expected to continue for many years.

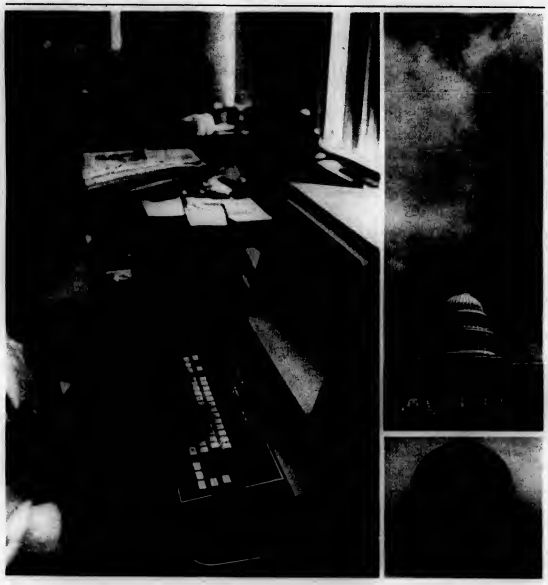
"There are two reasons for the expected steady growth," according to R. Michael Pengelly, professor of computing science. "One is that we will create more classes that will actually require the use of the computer. The other is that as people in the university become more familiar with the computing centers and facilities, they will discover how they can use the computer as an aid to a particular course they have running at the moment."

Future uses of the HP 2000F may include grading of objective tests with accompanying feedback of comments to students on the basis of test results. At present, OU is grading those tests on an ICL 1903T, a computer exclusively used for administrative tasks.

"Not only would we like a much more immediate response to test grading," Pengelly said, "but we would like to give students some simple forms of advice and would like to make a report on their performance available to their tutors.

"The computer, therefore, could build a

(Continued on Page 27)



James Burrows inspects the Open University's HP 2000F while the computer center's assistant manager enters data at the terminal to change an existing student program.

Miniworld

Rows of modems stand ready to decode signals arriving from remote terminals and to allot each terminal one of 32 available channels into the Milton Keynes system.

Minis in Business — Part 2

Applications Planning Demands Total Involvement

By Theodore A. Franks
Special to Computerworld

Planning a minicomputer-based business application requires complete user involvement.

Development of an effective solution which meets immediate needs, maintains a symbiotic relationship with the host system and allows for future growth is not a trivial task. The mini itself is but a tool in the larger sphere of the problem solution to be considered by the user.

The mini is the "hardware heart" of the application, but the selection of which mini is affected by performance demands, costs, availability of software support, and most importantly, adaptability to the hardware configuration required.

Mini selection is naturally followed by selection of fourth-generation peripherals to satisfy the very reason for the application. Emphasis is placed on the mature nature of the peripheral, because there are enough other problems to occupy one's time without suffering the difficulties unreliable equipment can offer.

Growth potential in terms of quantities of peripherals and attachment of additional types is significant to assure long-range usefulness.

Since the new system is supposed to be more cost-effective and reliable than the one it is replacing, developing the hardware configuration is critically important.

Considerations such as backup facilities in the event of hardware failures, on-line maintenance for real-time system requirements, programmatic or manual switching of the configuration resources and ease of developing/debugging new applications are significant.

The method of interfacing the mini system to the host processor can be quite varied. As in the case of emulating an older peripheral subsystem, the attachment is through the input/output channel. An interface can equally be as loose as removable media such as magnetic tape of disk packs. In between these extremes are computer-to-computer channels and communications links (local or remote).

An often overlooked consideration is error detection, control and recovery facilities. The ability to guarantee data integrity and provide reasonable techniques for recovery from system failures is frequently the most difficult part of the mini development program.

Software development tools must be available in order for the user and mini system supplier to efficiently create the applications software package. Since the user will be more intimately involved with the software development process, extensive debugging facilities become an early requirement in the application evolution.

Maintenance of mini systems is of greater concern to the user than the large host system itself. The large system supplier has to his advantage extensive field engineering staffs, while mini system suppliers by their very nature will be offering equipment with many different points of manufacture. Only through a competent service group can the potential for chaos be avoided.

Training provisions for user personnel such as programmers and operators must also be provided.

Actual implementation of the application eventually requires a cutover period. Keeping "business as usual" while going to the new system is not a matter of chance; only adequate planning can prevent periods of total collapse.

Finally, after the new system has been planned, developed, installed and placed on-line, hopefully successfully, a period of software maintenance is initiated. Not only must the immediate application be defended and kept free of bugs, but new applications and tasks must be able to be implemented.

In Part 3 Franks will describe several applications of mini systems.

Franks is a vice-president at Formation, Inc.

Miniworld

UK Students Taught Over Telephone Lines

(Continued from Page 26)

better bridge-between the student and the institution. The machine could gather and analyze student information, but the tutors would actually make the decisions based on that information.

"We think that this would be more fruitful than implementing computer-aided instruction that suggests to the student to skip section 4 and concentrate on section 9. The latter is a difficult program to write, but reporting on the student's progress to his tutors is an interesting possibility."

When the OU planned its computer network five years ago, it found that in the teaching of computing the most economic approach was to go for the simple, single-language dedicated system.

"In my experience," said Burrows of the computing service, "the Basic language is ideal for teaching computer science. It is a language that has reasonable numerical features so that we can teach numerical analysis.

"It has good string-handling features so we can teach about data manipulation within the machine. Plus it has good file handling so we can teach about data processing or even data bases if one wanted to program the system.

"From the teaching point of view, our present system is ideal because the student can be hooked into it without learning complicated job control languages."

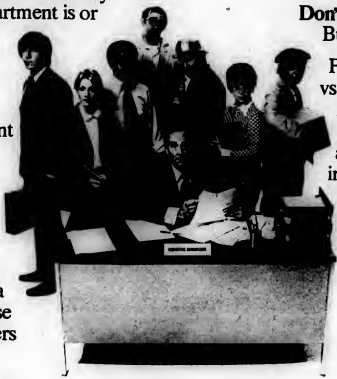
Each of the three HP 2000F systems is comprised of an HP 2100 main processor, an HP 2116 front-end processor, a 23.5M-byte moving-head storage disk, a 2.4-M-byte fixed-head disk, a 9-track magnetic tape unit, paper tape reader and punch, a systems console and two hardware multiplexers. There is also a line printer at OU headquarters.

IF WE CAN'T HELP YOU MIND YOUR OWN BUSINESS, NOBODY CAN.

What would it mean if your key people could know the status of every department in your company any minute of the day? No matter where the department is or what it does? No matter what kind of business you're in?

On top of that, what if each individual department not only knows where it stands on an up-to-the-minute basis, but also knows the status of all related departments?

What if we told you General Automation has a brand new answer for these questions and a lot of others just like them?



A new ending for an old story.
Data management, or the lack of it, isn't a new problem.

What we offer is a totally new network approach. One that replaces a lot of time-consuming, non-productive status meetings, paperwork and guesswork with simple, economical, automated systems that tell everyone who needs to know, everything they need to know, whenever they need to know it. No matter where they are or what they do or how they do it.

Right about here, it would be wonderful if we could stop philosophizing and tell you about a magic computer that does everything. But, it's not that simple.

Don't buy a computer.
Buy a solution.

Forget about mini vs. maxi, batch vs. real-time and first decide what you want to accomplish. What kind of information has to flow? Where is it coming from? Where is it going? What are you going to do with it when you get it?

What can be processed in batches? What do you have to know right now?

Do you want to do a few jobs fast? Or a lot of jobs not-so-fast?

And so on.

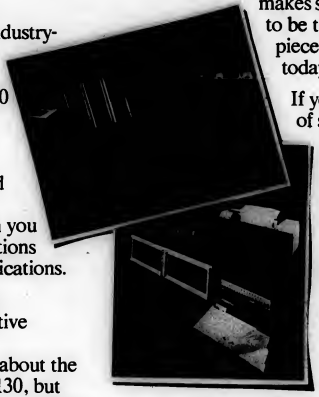
When you've pinned down all the questions, we know where you can get all the answers.

We've got data management surrounded.
General Automation can approach your data management requirements from your point of view.

If you're interested in high-performance systems offering decentralized control and custom applications software, our new DM-100 family is the right way to go.

If moderate performance, more centralized processing and a vast library of standard applications packages will work for you, you'll be interested in our DM-200 family.

The performance-oriented family.
Our DM-100 family consists of systems for remote job entry (DM-120), satellite processing (DM-130) and powerful central processing centers (DM-140)—each built around our high-performance SPC-16 computer. When tied together, they form a compatible network of products that can communicate with each other and provide upward expandability where you need it when you need it.



A number of specific industry-oriented application programs are available for use with the DM-100 family. We also offer general libraries for statistical analysis, operations research and financial planning. If needed, we'll work with you to develop custom solutions for your particular applications.

We also make a special low-cost, highly interactive system. It's called the DM-130/2 and has just about the same specs as the DM-130, but without the range of expandability. (It is available through a separate, nationwide network of distributors established to handle the special turn-key business system requirements of first-time users.)

The application-oriented family.
Lots of applications and less decentralization calls for our DM-200 family. It is based on our 18/30 computer and a vast library of standard software for applications in manufacturing, distribution, finance, engineering and publishing. To name just a few.

The DM-200 family includes systems for data transfer (DM-220), high-throughput batch processing (DM-230) and basic batch processing with on-line interaction (DM-240). We also offer the DM-230/2—the world's number one IBM 1130 replacement system.

One answer for a dozen questions.
This ad only scratches the surface of our new approach to data management.

So, in the space we have left, we'd like to impress you with the heart of our message:

General Automation is the only computer company that offers total as well as isolated data management solutions at a price that makes sense. Someone else may claim to be the expert at solving the piece of the puzzle troubling you today, but what about tomorrow?

If you consider the total package of system growth, compatibility, stability, power, software, field support, manufacturer involvement and price, nobody can beat us. Nobody.

Challenge us to prove it.
Write for specs.
Talk to our salesmen.
Compare us with our competition.

For further information on data management systems, write General Automation, 1055 South East Street, Anaheim, California 92805.
Or call (714) 778-4800. In Europe, write General Automation, S.A., 24 rue du Sergent Bauchat, 75012 Paris, France.
Telephone (1) 346/7973. In Canada, write G.A. Computer Ltd., 880 Lady Ellen Place, Ottawa K1Z5L9, Ontario.
Telephone (613) 725-3626.

DATA MANAGEMENT SYSTEMS BY
GENERAL AUTOMATION

11/04 Marks 3rd Generation Of DEC Mini

MAYNARD, Mass. – The PDP-11/04 from Digital Equipment Corp. (DEC) is said to mark the beginning of the third generation of DEC's PDP-11 minicomputer line.

The PDP-11/04 features a single-board central processor that utilizes TTL logic. It employs 4K semiconductor MOS memory chips and has a read-only memory (ROM) hardware "bootstrap" loader. ROM diagnostics, direct memory access and four-level interrupt structure are standard, and it employs the full PDP-11/05 instruction set, the firm said.

The standard configuration includes an operator's console, which has on/off, boot and halt/continue switches. Memory is available in either 4K or 8K units.

The use of semiconductor memory has allowed DEC to lower the entry level price of its 16-bit computer family by 30%, while increasing instruction execution speeds by an average of 20%, a DEC spokesman said.

All standard PDP-11 options are available including a programmer's console, but the addition of such options can increase the price to comparable PDP-11/05 levels.

The PDP-11/04 is priced at $2,495 with first deliveries scheduled for July.

DEC PDP-11/04

Wang Basic 2220/2200S

Miniworld

HP 21MX Use Cuts $ Up to 12%

CUPERTINO, Calif. – Six Hewlett-Packard (HP) computing systems are now available using semiconductor memory at prices up to 12% less than HP's earlier core-based systems.

The family of business, time-sharing and scientific systems may be purchased with the user-microprogrammable HP 21MX processor, which uses 4K random-access memory (RAM) semiconductor memory chips.

The older core memory HP 2100 minis will still be available, HP said.

The 21MX implements existing HP 2100 software and ongoing tests indicate its semiconductor memory to be at least twice as reliable as core, HP claimed.

A power control module enables the 21MX to remain unaffected by line voltage fluctuations of ±20%, HP said.

Business systems incorporating the 21MX include the M/210, M/230 and M/260. The M/210, priced at $29,790, is a disk-based operating system for business batch computations. A comparable system using a core-memory minicomputer is $30,950.

The M/230 serves data entry users as a local stand-alone transaction processor that can be expanded to operate as many as 32 terminals simultaneously. Price of the M/230, including a CRT, 4.9M bytes of disk storage and a 1,600 bit/in. magnetic tape unit, is $48,950.

The price is the same as earlier core-based systems but users gain the benefit of 10 additional prewired I/O slots, HP said.

With the M/260 system, as many as 32 terminal users can have simultaneous access to a common data base. Data is maintained and manipulated by HP's Image/2000 data base management system software.

The system includes a 48K-byte 21MX, a 30 char./sec printer, a 5M-byte cartridge disk and a 1,600 bit/in. magnetic tape unit. Price is $50,500, a savings of about $3,450 in comparison with similar HP core-memory systems.

In the time-sharing area, the larger 2000/F is now priced at $63,500 ($1,250 less than previous system prices) and in its basic configuration has two 21MX processors, one with 64K bytes, the other with 16K bytes of memory, a 16-port multiplexer, a 4.9M byte disk drive, an 800 bit/in. tape unit and a 30 char./sec system console.

The HP 9640 scientific system now also incorporates the 21MX with savings averaging about 10% in larger configurations, HP said.

Wang's 2220/2200S Combines Keyboard CRT, Tape Cassette

TEWKSBURY, Mass. – The Basic 2220/2200S model computer is a compact version of Wang Laboratories' System 2200 computer.

The system, priced at $5,400, combines a CRT display, a tape cassette drive and a dual-purpose keyboard into one unit. Its CPU includes a hard-wired Basic interpreter, standard 4K bytes of memory expandable to 16K and has the ability to operate an additional peripheral, such as a printer, Wang said.

In addition, the system allows a user to edit, insert or delete characters in a partially entered program line or input statement as well as in program lines already stored in memory. The line being edited is displayed on the CRT.

A matrix read-only memory system provides the user with 14 built-in matrix operations, and the CPU can be expanded to accept up to three additional peripherals for those applications requiring additional tape cassette drives, interfacing or telecommunications, Wang said.

The 9-in. diagonal CRT displays 16 lines of 64 characters. The unit's keyboard combines a standard alphanumeric keyboard with a Basic keyboard which allows input of Basic statement with a single keystroke.

The unit is compatible with the Series 2200. Estimated delivery is four weeks from the firm at 836 North St., 01876.

Nova Gets 23M Bytes

PLAINVIEW, N.Y. – A plug-compatible magnetic tape cartridge system -from Qantex is said to offer Data General Nova users up to 23M bytes of storage.

The Series 2400 is available with one to eight tape drives, each with one to four tracks. The 3M Co. data cartridge used with the system has an unformatted capacity of 2.8M byte/cartridge. Data transfer is 6 kbyte/sec, the company said.

Prices for the Series 2400 interfaced to any Nova including power supply, rack-mounted chassis and cables start at $2,550. The firm is at 200 Terminal Drive, 11803.

CI Notes

Adapso Asks Fast Action On AT&T-Justice Suit

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) has asked for "prompt and determined action" from the Justice Department in its antitrust case against AT&T.

"We are most concerned that the case might take 10 years or more to be concluded. The computer services industry and the users of data communications services need rules and guidelines on which to base corporate investment and development plans. A prolonged case could have damaging effects," said John Duffendack, chairman of Adapso's committee on data communications.

Ten years of legal procedures for this suit could well result in AT&T winning its battle by attrition, added Jerry Dreyer, executive vice-president of Adapso.

Inforex Buys Printer Firm

BURLINGTON, Mass. – Inforex, Inc. has acquired Data Interface, Inc., which manufactures and markets a nonimpact line printer.

"The product not only nicely complements our current systems line as a peripheral device but also affords us an opportunity to continue and expand the outright [OEM] sales activities begun by Data Interface," said Inforex Chairman T. Cronin.

Manufacturing of the printers will be transferred to Burlington.

The acquisition was made in exchange for 107,067 shares of Inforex common and $45,000 cash.

HP Orders NCR Printers

DAYTON, Ohio – NCR Corp. has received an order valued at about $500,000 from Hewlett-Packard Co. (HP) for 500 EM-T3 thermal printers and power supplies. NCR has an option to buy up to 3,000 of each unit.

HP will use the units in test equipment, medical terminals and computation equipment.

Supershorts

Computer Automation, Inc. has named Original Equipment Sales Proprietary, Ltd. as its Australian distributor.

– – –

Hempstead Bank has received a patent on a system embracing the electronic transfer of funds at the point of sale between banks, merchants and depositor-customers. The system, known as Instant Transaction, will be implemented early next year in several areas on the north shore of Long Island, N.Y. served by offices of Hempstead Bank.

But Profits Will Rise

'75 Mainframe Shipments Seen Down

By Molly Upton
Of the CW Staff

CAMBRIDGE, Mass. – Worldwide net shipments of U.S. general-purpose computers in 1975 will be about 70% of the 1974 net of $9.5 billion, according to Frederic G. Withington's annual forecast for Arthur D. Little, Inc.

However, this does not mean that revenues and profits will also decline, he pointed out.

"A downturn in the product cycle aggravated by the general economic situation will reduce U.S. manufacturers' 1975 net shipments [value of new machines less value of old machines returned] by 30% to 40% in the U.S. and 20% to 30% abroad," he said.

"Fortunately, since most computers are rented, these net shipments will add revenues to those already being derived from the existing base; the industry's 1975 revenues and profits should be higher than 1974's," he observed.

Product cycles determine shipment upturns and downturns, he noted.

Essentially all of IBM's mainframe shipments are "turning down," such as the 158 and 168, "and we think also the middle range."

On top of this is the economic pressure, with big users trying to hold the line and some sending equipment back for 360s. This tends to exaggerate the problem, he said.

Withington declined to pinpoint projected 1975 revenues and profits, as revenue is a mix of what proportion of shipments are purchased, which is hard to predict, he said.

In 1974, he noted, IBM had a high purchase component, so purchase revenues should be down this year, and this could affect the growth in IBM revenue.

"The year 1975 will probably go down in the annals of the U.S. computer industry as the first year in which its foreign net growth exceeds its domestic growth. From now on, shipments to foreign markets will dominate its performance," Withington said.

The smaller machines will show a higher growth rate in the foreign market. Something like the Burroughs 700, for example, is doing better abroad than it is here, he said.

There are about 300 small new Honeywell systems installed abroad, but they are only beginning to be installed here, Withington added.

Shipments of large-scale machines, valued above $1.5 million, will be most severely affected, he said, and the gross value should be down 50%.

The net value, he added, should be down by 30% to 40%.

"The point here is that everyone who wants 158s and 168s pretty much has them, and Honeywell 6000s and Univac 1110s are approaching that point. The large Burroughs systems might do a little better.

"People are looking forward to FS and beginning to wait to see what it's like," he added.

The downturn in shipments of medium-scale machines selling for $200,000 to $750,000 is somewhat smaller, he noted. The decline could be off by as much as 40% in '75, he said, but added this figure could be less, as ADL's figures aren't hard.

This range includes the IBM 115, 125 and 135, which all had a "swell year in 1974." The 135, he noted, is late in its product cycle, and the 115 and 125, although newer, may have reached a temporary saturation point.

Net shipments of small general-purpose machines should equal those of 1974, he said.

ADL's definition of a small general-purpose system includes disk files, CRT and systems software, often including packages to accompany small business needs.

"The fact is that in past recessions, when there have been good machines available, small companies have bought them," he pointed out, contrary to the idea that small companies suffer most during a recession.

The interactive versions of the System/3, Burroughs 700s and new Honeywell low-end Series 60 have been selling very well, he said. Shipments in 1975 could be either up or down a bit from those of 1974. "We're a little confused; we call it 'up out even,'" he said.

Reverse Reaction

This recession could adversely impact a different section of the industry than did the last downturn, he said.

"In 1970-71, the shakeout was among service companies, and the minicomputer makers all did fine. This time around, we think it may be reversed, because the service companies that have survived are all quite strong now with good product offerings and larger businesses. This time it looks like the minicomputer makers will have the problem.

"The problem is that there have been so many minis shipped for inclusion into various test systems and typesetting systems, etc., that we're afraid industry can settle for what it has for a while, which was not true in the last recession," he noted.

"In addition, now people are becoming the desperate problem to the end user, and the service firms can sometimes provide a substitute for people." Buying a raw mini doesn't help immediately, but the small business system may help, which is one reason they're pretty strong. Then with the large systems there's a temporary saturation problem, he added.

Memorex Enters Maintenance, Aims Initially at Communications

SANTA CLARA, Calif. – Memorex Corp. has entered the third-party maintenance business.

Although it will initially concentrate on services in those areas in which it is already positioned and has special skills, such as communications, the firm plans to extend gradually to mainframes, explained William D. Randolph, director of field engineering for the firm's Equipment Products Group.

Memorex is aiming at both OEM and end-user business, he added.

The firm will bid to service "where we are selling to other manufacturers," such as the recent contract to furnish Business Systems Technology with disk drives [CW, Dec. 4]. In addition to communications and memories, the firm is seeking to service other products that are complementary to Memorex's business, Randolph said.

In marketing to end users, Memorex will evaluate installations on a case-by-case basis, he said, and could well include mainframe maintenance.

The firm is offering consulting on maintenance of communications equipment and maintenance diagnostics. In addition, Memorex will, much like a facilities management firm, assume responsibility for network maintenance management.

Good Investment

Randolph said Memorex sees the move into the service industry as "selling an investment we have, which is a good way to open new markets."

The potential growth rate of third-party maintenance and facilities management is greater than 20% annually, he said.

With its worldwide maintenance forces, Memorex offers new firms bringing products to market a way to bypass the high front-end investment of establishing maintenance forces.

"Memorex has a definite intention of being in the computer products marketplace in the long term. We believe that, to the extent we can expand our maintenance business, we can not only add profit but position ourselves both in terms of skill and size to accept new products in the future."

UK Service Bureau Revenues Lagging

LONDON – British service bureau revenues in the second quarter showed little growth over those of a year ago and lagged behind those of the first quarter, according to a report in *Computer Weekly*.

Figures from the Department of Industry showed total quarterly sales reached $69.6 million compared with $58 million in the same period a year ago and $71.9 million in the preceding quarter.

Sales of programming services grew from under $11.5 million in the second quarter of 1973 to nearly $14.6 million in the same 1974 period, but this was still less than the $16.2 million in the first quarter this year.

Total sales of computer processing services rose to $37.6 million from less than $33.4 million last year. However, remote access was the only sector that grew to any extent, from less than $6 million to nearly $8.8 million this year, the article noted.

Not surprisingly, remote processing showed the strongest growth among sectors engaged in business with foreign clients, doubling from $1.6 million to $3.2 million. Sales of programming and consultant services abroad stayed below $1.2 million, the newspaper reported.

The Department of Industry indicated the slump in second-quarter billings could be due to the slowdown in the first quarter and the postal strike.

Broken down by client groups within the UK, the figures show second-quarter sales to outside companies grew to $36.2 million from under $28.8 million in the year-ago period. This figure also was above the first-quarter total of $33.6 million.

Sales to parent and associate firms, however, showed only a slight rise from the year-ago figure and a decline from the first quarter, reaching $21.1 million.

International News

Total sales from running custom programs rose slightly to $16.9 million from $15 million in the year-ago quarter. This sector trailed behind first-quarter revenues of $18.1 million.

Revenues from processing package programs stayed nearly static at about $7.4 million, while time-for-sale revenues fell from almost $4.9 million to $4.6

Aussies Fine Sperry $860,000

Special to Computerworld

CANBERRA, Australia – The Australian Post Office (APO) has reported it levied an $860,000 charge for liquidated damages on the Sperry Rand Corp.

The charge, levied after Sperry's Univac Division failed to meet the completion date of a contract for a data network system, is believed to be one of the highest ever levied in any government undertaking here.

The disclosure of the levy followed the admission of J. Paul Lyet, chief executive of Sperry Rand, that Univac worldwide management reporting operations had been revamped because of this charge.

Canada Railways Plans Center by '76

Special to Computerworld

TORONTO – A multimillion dollar computer center will be established by Canadian National Railways in Winnipeg, Manitoba by 1976.

The expansion involves installation of two IBM 370/158s, one in Montreal in 1975 and the other in Winnipeg in 1976.

The Winnipeg center will handle a range of general accounting functions, process payrolls and assist with inventory control for the entire railways operation.

Foreign Orders & Installations

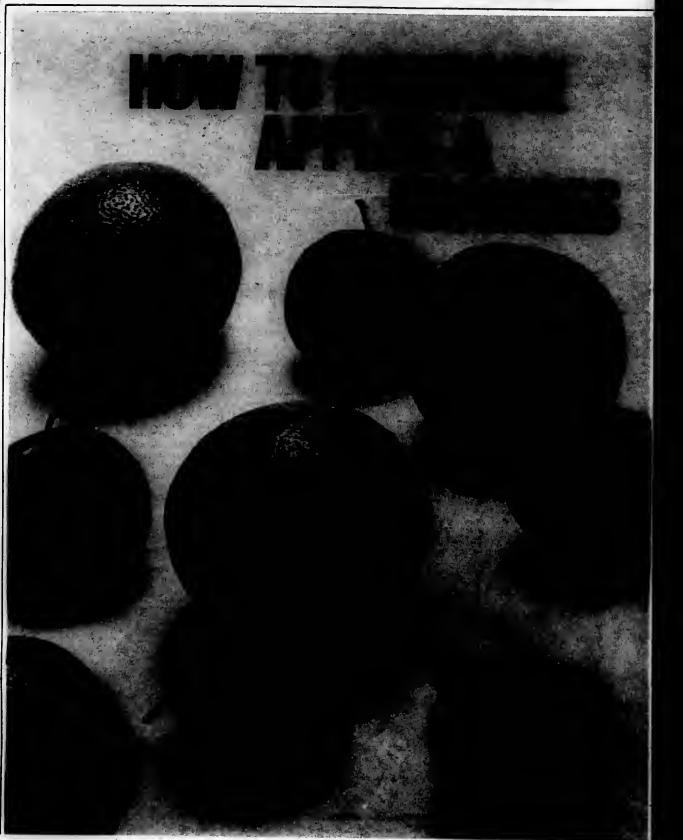
Inforex France, a wholly owned subsidiary of Inforex, Inc., will install 42 Model 1301 and 1302 data entry systems for the French National Railroad. They will replace 500 keypunches and verifiers.

Burroughs Corp. has installed a B3700 at the Istanbul Technical University and received an order for a B1726 from Istanbul University's College of Medicine. The B3700 will be used for student training and academic research, the B1726 for keeping patient records.

Mitsubishi Petrochemical Co. Ltd., Tokyo, has ordered a Univac 1106 to enhance its existing information processing system.

Hoskyns Systems Ltd., London, has installed Task/Master, a telecommunications monitor manufactured by Turnkey Systems, Inc., at John Laing Construction Co. in London.

Tha Caja Postal da Ahorros, the credit and savings arm of the Spanish National Post Office, has ordered a Univac 1110 system valued at $6 million.



Pertec Predicts $300 Bottom Limit for Floppy Disks

By Molly Upton
Of the CW Staff

CHATSWORTH, Calif. – Prices of floppy disk drives in OEM quantities won't fall much below $300, according to Donald F. Taylor, disk product manager at Pertec Corp.

A year ago Pertec was quoting $500/drive in lots of 500, and now the price is about $395, be said. But he doubts if it will go much lower than that; "you're fighting inflation."

For extremely large volume orders, Pertec's price is about $300. "That's about the bottom of the bucket," he said.

One reason Pertec can charge a relatively low price is that it exemplifies the credo of vertical integration and makes almost all the components for its drives, such as beads and motors, and uses a steel chassis.

"We've just adopted the attitude that this is a very price sensitive marketplace and you cannot afford to buy things and resell them in this kind of market," he observed.

"Also, we've found that it's to our benefit to own the tools and build the pieces, because it's our company, our problems and our shipments," he stated.

In addition, in order to avoid second guessing the mix of international and domestic orders, Pertec designed its drive as a direct drive dc motor instead of a belted ac motor. By having only a dc motor, there is no inventory problem for either Pertec or its OEM customers, he said.

"The companies I believe will succeed," Taylor continued, "are the manufacturing companies that have the financial stability to last out the start-up phase. Then it will come down to purely manufacturing and marketing expertise."

Several other floppy disk manufacturers have more business in large-ticket items and do not have the production resources for high-volume, low sales price, electromechanical devices, he added.

The start-up period is difficult because for most OEM products it takes 18 to 24 months to receive volume orders from customers, since it takes them time to design the product into their lines.

This start-up period has tended to become even longer for floppies since the device "is not sophisticated" and many of the larger buyers decided they could make it themselves.

But they discovered "this is a dilution of their engineering resources," Taylor remarked.

"Why take an engineering department in a $1 billion company that does $1 billion in big systems and put engineering resources on a $300 component, when what he should be doing is spending those dollars developing additional systems? That's where his business is," he said.

He also pointed out that there isn't a lot of electromechanical expertise among some of the larger companies.

By the time firms have discovered they can economically buy the drive, and then engineer their product around the drive chosen, the delay in volume orders has been extended beyond the normal 18 to 24 months.

For the Future

Looking ahead, Taylor predicted the market would develop during the first half of 1975. "There's a substantial number of machines being shipped this year, but they're going to little guys." It's the big customers who will provide the volume and establish standards for double-density and more tracks, be suggested.

"There are probably 25 companies in the world, outside of IBM, that will represent 80% of the volume," he added.

Of approximately 20 firms in the industry, Taylor said he sees about four or five disappearing or being bought out, another five backing into the systems business by offering products such as controllers and formatters and more services, leaving about five firms concentrating on volume OEM orders.

Pertec is shipping a double-density floppy disk drive that is IBM-compatible but capable of handling 500K bytes instead of the customary 250K bytes.

The electronics and the head are designed to handle the additional frequency requirements through a Miller code scheme.

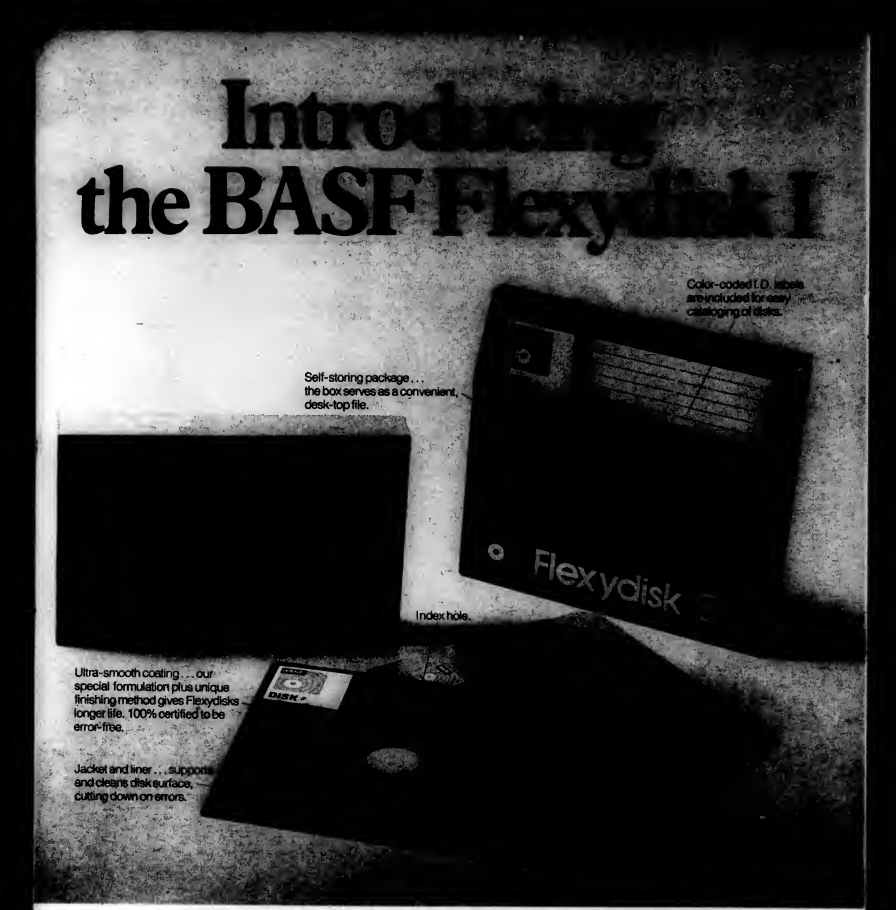
Possible trends in the future include double-density units, recording on both sides of the floppy disk and a read-while-write capability.

But be warned that "you can't get too far out in front of IBM or you're liable to miss a corner," regarding the possible trend toward flip side recording.

One question facing the industry is "whether to take a $300 device and increase its capability," Taylor noted.

"The popular saw is 'I want 1M bytes and I don't want to pay $1,000 for it.' I think perhaps the industry is better off offering a rigid device as opposed to trying to push a flexible" drive in this instance, he said.

Introducing the BASF Flexydisk I



Our new Flexydisks have been specially designed and formulated to provide trouble-free performance on 3740 and compatible equipment utilizing flexible disks.

Each Flexydisk 1 has 77 tracks and can store up to 252,928 bytes... or approximately 3,000 80-column cards. There's no better buy than BASF Flexydisks, and here are some of the reasons why:

Flexydisks are 100% Certified error free... and they're initialized.

Every Flexydisk 1 is 100% certified so you won't have mistakes to cope with. Each disk is also pre-formatted for immediate use. Flexydisks have a clean, debris-free surface like our computer tape. A special dual-purpose coating gives increased disk and head life. Our tests have shown head wear to be less than 23.5 micro-inches in 92 hours of head loaded operation!

Flexydisks won't leave you short if 3740 equipment is updated, either. We've coated and finished them on *both* sides. Just to be sure.

Flexydisks are Self-Cleaning.

We pack our Flexydisks in a special, self-cleaning jacket and liner. This unique method of packaging cuts down on friction and the possibility of errors.

Flexydisks are Easily Stored and Mailed.

A good product deserves a good package. Flexydisks come in compact, tabulated library 5-packs. They save on storage and record-keeping, and make neat desk-top files. They're a great time-saver. A supply of color coded labels is also included for easy job identification.

Drop us a line and we'll send you complete details on Flexydisks. BASF Systems, Crosby Drive, Bedford, MA 01730.

You're already paying for BASF quality, you might as well have it.

PCS Micropac Incorporates Intel 8080

FLINT, Mich. – The Micropac microcomputers from PCS, Inc. combine the Intel 8080 microprocessor with interfacing for analog or digital instrumentation, communications devices or a variety of host computers.

The standard Micropac includes the Intel CPU packaged on a self-contained logic module and 5K bytes of memory (4K random-access, 1K read-only.)

It can be ordered to address up to 65K bytes of memory and is available with a real-time clock plus necessary interfacing capabilities.

The OEM version costs $1,825 from the firm at G-4025 S. Center Road, 48507.

Micropac 80 Microcomputer

Dataproducts Adds 1620

WOODLAND HILLS, Calif. – Dataproducts Corp.'s Store/1620 is a 16K-word by 20-bit planar core memory system that can be used with either minicomputers or larger systems, the firm said.

The 650 nsec memory can also be ordered in an 8K-word by 18-bit version.

The Store/1620 modules can be stacked to provide a 65K-word system and costs $1,995 in OEM quantities from the firm at 6219 De Soto Ave., 91364.

Monostore Holds 3.5M Bits

ENGLEWOOD, Colo. – The Monostore VII/Modular semiconductor memory system from Monolithic Systems Corp. can contain up to 27 memory array cards in a single chassis to provide over 3.5M bits of storage.

The system is designed around a 4K by 1 N-MOS dynamic random-access memory.

Memory access time is 500 nsec; cycle time is 700 nsec.

A 48K by 16-bit memory in OEM quantities costs $5,425 from the firm at 14 Inverness Drive E., 80110.

Magstripe 20 Reads 3 Codes

TORRANCE, Calif. – The Magstripe Model 20 magnetic stripe card reader from American Magnetics Corp. is a more compact, easier to operate version of the company's earlier Magstripe Model 10, the firm said.

The Model 20 reads encoded information in any combination of American Banking Association, International Air Transport Association or Thrift Institutions stripe formats. The typical read cycle time is 2 sec.

The Model 20 is manually operated and costs $175 from the firm at 2424 Carson St., 90501.

OEM Products

Recorder Costs $760

ROCHESTER, N.Y. – The 8410 Datacassette from Techtran Industries is the firm's lowest priced digital cassette recorder and is designed for applications requiring a less sophisticated device, the firm said.

The 8410 offers storage of 145K char./cassette; switch-selectable speeds of 110-, 300-, 1,200- and 2,400 bit/sec; remote control of all machine functions; and a 120 in./sec rewind speed.

The 8410 costs $760 in OEM quantities from 580 Jefferson Road, 14623.

Illegal Gift-Giving?

N.Y. Investigating Payroll Service Firm

By Patrick Ward
Of the CW Staff

NEW YORK – A payroll processing company here has been accused by the State Commission of Investigation (SCI) of illegally giving money, gifts and the services of call girls to board of education employees to win DP work from the board.

"We would deny those allegations," said an attorney for Computer Specific Corp., which has received over $2 million from the board of education over the last four years for processing the semimonthly paychecks of 35,000 school paraprofessional and lunch room employees.

Seymour Sayetta, an owner and secretary/treasurer of Computer Specific, stated there was nothing improper in connection with the company's work for the board.

He declared his firm had done the payroll processing more efficiently and more economically than anyone else could have, including the board.

Although he admitted Computer Specific had given Christmas gifts of perfume, umbrellas and radios to "hundreds" of school board employees, these are apparently not the gifts the SCI mentioned in an affidavit charging Computer Specific with paying graft to school employees.

But even perfume, umbrellas and radios are gifts of value, school chancellor Irving Anker said, and their acceptance by school employees from companies doing business with the city schools would violate board regulations.

These inexpensive gifts went to secretaries and clerks, who, Sayetta said, could not and were not expected to do anything for his company in return.

After learning of the SCI affidavit, the school board stopped dealing with Computer Specific, which had no written contract and had never bid for the work.

The New York County Supreme Court is expected to deliver an opinion soon that will either compel Computer Specific to deliver documents or quash the SCI case.

Adapso Names Officers for 1975

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) elected its officers and directors for 1975 at its 14th annual membership meeting.

Robert W. Olsen, president of Computer Services Corp., was re-elected president.

Other elected officers include first vice-president, Leon Weiburgh, Anstat, Inc.; second vice-president, John Duffendack, The Cyphernetics Corp.; and treasurer, L.E. Pfeiffer, A.O. Smith Corp.

The Data Center Section of Adapso also elected Pfeiffer as its new president. Other officers are vice-president, B.J. Williams, Unitab Co., and treasurer, Frank Casey, Automatic Data Processing.

The Adapso/Software Industry Association also held elections, naming Lloyd Baldwin of Cincom Systems as president. Vice-president is Richard Thatcher Jr., Atlantic Software, Inc., and the new treasurer is John Christiansen, Independence Computing and Software Co.

Rich Crandall, president of Com-Share, Inc., was elected president of Adapso's Remote Processing Services Section. Other officers are: vice-president, Curt De Forest of Grumman Data Systems Corp., and treasurer, Weisburgh of Anstat.

Dealers Hold Elections

NEW ORLEANS – The Computer Dealers Association elected Norman A. Burger of Corporate Computers, Inc. as president, replacing Adolf F. (Sonny) Monosson, who was named chairman. Monosson is president of American Used Computers.

Vice-Presidents

Vice-presidents are George H. Heilborn of IPS Computer Marketing Corp. and James D. Lunceford of L&A Computer Industries, Inc.

Stuart Rubenstein of IOA Data Corp. is treasurer and Ken Bouldin of Econocom, Inc. was named secretary.

Fold and insert order form (attached through binding) and remittance here.

Use the attached order form and remittance for:

- **A new subscription**
- **New address**
- **New Title**
- **New Industry**

First Class
Permit No. 40760
Newton
Mass.

BUSINESS REPLY MAIL

No postage stamp necessary if mailed in the United States

797 Washington Street
Newton, Mass. 02160

Position Announcements

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

Accounting Software Salesman

A nationwide data processing company is looking for experienced salesman to market accounting applications software. Positions are now open in Chicago, Montreal, and Toronto.

Candidates should have the following qualifications.

- Sound Data Processing Background
- Proven Sales Record
- Solid Grasp of Business and Accounting Practices

The position has an excellent salary and benefits program with a potential to grow with this aggressive company.

Send resume and salary history to:

CW Box 4256
797 Washington St.
Newton, Mass. 02160

DUNHILL EDP

Start the New Year Right By Investigating these Most Urgent Client Requirements

$13,000—$22,000

Systems Programmer – DOS/VS-Power
Systems Mgr. – Property/Casualty Ins.
Analyst Prog. – Mfg./Bill of Materials
Systems Consultant – Financial/MIS
Analyst Prog. – Banking-B4700
Analyst Prog. – Distribution/Order Entry

Call Rey Dunn Collect (802) 264-1166 or direct your resume, including salery history to:
22 E. Mitchell
Phoenix, AZ 65012. 100%
Employer Retained—Netionwide
EDP Specialists

SYSTEMS PROGRAMMERS

MONDAY THROUGH FRIDAY: 9AM TO 5PM

Chemical Bank, an international financiel organization, has an opening for an experienced systems programmer. Our ideal candidate will have 2 years experience with DOS/VS/SYSGEN, and Assembler Language. Some background with CICS desirable. Environment will be 370/156 with 3330. EXCELLENT salery plus full "Banker's Benefits."

CHEMICAL BANK
is an equal opportunity employer

Please submit confidential resuma, or epply directly to Personnel
55 WATER STREET, NYC 10041
North Building — Room 300

SENIOR PROGRAMMER-SOFTWARE SYSTEMS

This position offers excellent opportunity for programming professional to join Kiewit Computation Center. Duties will include: supervision of student programmers and assistants; scheduling programming and research projects; participation in projects using high level languages and system stimulation; coordination of programming section with other areas within and outside department. Background must include B.A. (or equivalent in experience), plus 3-5 years' involving both commercial and educational environments. Knowledge of assembly programming language and various systems essential.

Send resume with salary history: Manager of Employment, Dartmouth College, P.O. Box 283, Hanover, N.H. 03755.

DARTMOUTH COLLEGE

An equal opportunity employer with an affirmative action plan.

OVERSEAS

Positions are available for experienced:
IMS SYSTEMS ANALYSTS
IMS SYSTEMS PROGRAMMERS
OS/VS SYSTEMS PROGRAMMERS
IMS/OS/COBOL INSTRUCTORS

If you are interested in working with VS2, TSO, HASP4, IMS and a large TP network including 3270's and in being eligible for the $20,000 overseas tax deduction while earning top dollar for your skills, send your resume to:

TECHNICAL SERVICES CORPORATION OF AMERICA
2924 Red Lion Lane
Silver Springs, Maryland 20904

PROGRAMMERS PROGRAMMER ANALYSTS & SYSTEMS ANALYSTS

Career Positions with national computer services firm for programmers and programmer analysts with experience in:

GE - 635, H-6000, GECOS
IDS, COBOL, IBM 360-370
DOS, OS, COBOL, ALC,
PARS, IMS, UTILITIES AND DBOMP

CALL COLLECT CLIFF TAYLOR
(214) 243-3421

Or send resume outlining your qualifications, experience and salary history to:

CUTLER-WILLIAMS, INC.
2655 Villa Creek Drive, Dallas, Texas 75234
An Equal Opportunity Employer M/F

Run With Us in '75

Whether you're buying, selling, swapping, hiring, or looking, Computerworld Classified's work.

Our new 1975 rates go into effect January 1, 1975. It will now cost you 49.70 per column inch. The minimum size ad is 1 column by 2 inches deep, and costs $99.40.

Write your ad and send it to:
Computerworld Classified Advertising

HOSPITAL FINANCIAL SYSTEMS

DNA/AVENT, a leading manufacturer of computer systems for medicine, has an immediate opening for a Senior Programmer Analyst to participate in the development and installation of Financial Systems for hospitals. Activities include systems specifications, design, development and installation. Background should include 5-10 years of assembly language and FORTRAN experience. Of specific interest are applicants with supervisory experience. Individual must have a minium of 4 years experience working for a hospital in the design and implementation of a Hospital Financial System. Send resume to D. Dean Houck.

DNA AVNET
DIVERSIFIED NUMERIC APPLICATIONS
DIV OF AVNET INC

ANALYST/PROGRAMMER

This challenging oppty offers a qualified professional a chance to develop sophisticated applications in a diversity of fields. A large IBM Data Center in greater Buffalo Metropolitan area, our client handles both corporate financial applications and outside consulting EDP projects. Exp in OS/COBOL & Data mgmt is a must. Project responsibility encompasses analysis & design through implamentation. $14-$16K (fee paid).

ROBERT HALF PERSONNEL AGENCIES
1310 Liberty Bank Bldg.
Buffalo, N.Y. 14202

SALESMAN WANTED

Leading computer ribbon manufacturer seeks experienced Sales and Managerial personnel, representatives, etc.

Excellent opportunities for men now selling computer ribbons, typewriter ribbons and computer tapes.

CW Box 4216
797 Washington St.
Newton, Mass. 02160

First Commerce Corp.

First National Bank of Commerce Has openings in its computer center located in sunny, snow=free New Orleans. Challenging positions working with IBM 370/145 and 370/155 operating under D.S. are now available.

If you have minimum 5 yrs. of data processing with supervisory experiance, we are looking for a day shift coordinator to direct control and computer operations.

If you have 3 years of D.S and J.C.L. experience and would like a 3-day workweek, apply for a J.C.L. technician position.

If you have a minimum of 2-3 years D.S. experience as a computer operator and would like a 3-day work week, send us your resume now.

Excellent benefits, good salaries, a progressive management atmosphere, and a great location, make these jobs extramely desireble.

Send your resume in confidence to:
William S. Culver, Jr.
Employee Relations
First Commerce Corp.
210 Baronne St.
New Orleans, LA 70112
An equal opportunity employer

Université du Québec à Trois-Rivières

SENIOR SYSTEMS ANALYST FRENCH-SPEAKING

Medium-sized university seeks individual able to communicate well in English and French, minimum four years experience in the design and implementation of administrative systems. Bachelor's degree, willingness to assume leadership of projects is essential and some exposure to data base management systems is desirable. We use a CDC-3300 under Master 4.0 and a CDC-CYBER 73 under KRONOS 2.0. Salary depending on qualifications. Send curriculum vitae to: M. Jean Lapointe, Directeur du Centre de Calcul, Universita du Quebec a Trois-Rivieres, C.P. 500, Trois-Rivieres, Quebec, Canada. Call: (819) 376-5251.

EDP MEN & WOMEN A GOLDEN OPPORTUNITY

You can earn an extra $25,000 or more per year while still retaining your present position by selling Computer ribbons, Computer Tapes, and Typewriter ribbons. Manufacturer pays commission each month. Terrific repeat business.

CW Box 4229
797 Washington St.
Newton, Mass. 02160

Customer Service Engineers

Jr. CE .... to $1100 mt.
CE .... to $1300 mt.
Sr. CE .... to $1500 mt.
Tech Spec. .... to $Plus mt.
Field Mgrs. .... Sal Neg. mt.

We're specialists in "Customer Engineer" Extractions.

Bill Gill And Associates
5724 W. Diversey Av.
Chicago, Ill. 60639
(312) 622-7711

SYSTEMS SOFTWARES EDP TECHNICAL SYSTEMS ANALYST

Rapidly expanding prestigious package goods firm needs Analyst in Manhattan based operation to perform DOS systems support for our corporate data center and programming staff. Responsibilities include DOS generation, EDP standards, systems auditing, operations and programmer support, hardware evaluation and limited software programming.

The successful candidate should be a self starter with at least 3 years of DOS/VS COBOL experience with a working knowledge of BAL, ANS-COBOL, RPG II on IBM 370 computers.

We offer an excellent starting salary and benefits package.

Send resume including current salary to:

Box 784-BN, 1501 Broadway
Suite 1815, NYC 10036
Females & Minorities Invited to Apply

PROGRAM/ANALYST TRAINEE STATE UNIVERSITY OF NEW YORK

Will be responsible to write COBOL Programs under the direction of a project leader. Will assist in design phases and produce documentation of systems. Qualifications: An A.S. degree in computer science from an accredited community college or two year technical college OR a degree from a four year college with at least 12 hours of course work in computer related topics OR equivalent work experience in a computer center. Salary: $9,000.

Respond with resume by December 26, 1974 to:
Personnel Director
SUNY Central Administration
99 Washington Avenue
Albany, New York 12210 EEO/AA

MARKETING REPRESENTATIVES

A major data processing services operation, expanding marketing efforts in the Chicago-Midwest area, is looking for professional data processing-oriented marketing representatives whose expectations include challenge, growth, and opportunities.

Qualifications include a desire and aptitude to work with clients in a marketing environment. Individuals must have 2-4 years marketing expertise. Prefer experience in marketing software systems, data processing services, keypunch sales, and source data entry services. Individuals must be professional, aggressive, and truly interested in growth, client satisfaction, and a marketing career.

Our company offers a professional environment, growth, respect, and is client-oriented. We offer the elite in software systems to a broad range of industries, as well as the finest services available through our information processing center. Home base is Chicago. Limited travel. Excellent fringe benefits. Salary open.

Please send resume, with salary requirements, to CW Box 4255, 797 Washington Street, Newton, Mass. 02160.

An Equal Opportunity Employer

SPECIALIZED APPLICATIONS PROGRAMMER COMPUTER—ASSISTED TYPESETTING DEPARTMENT OF ADMINISTRATION MADISON, WISCONSIN

As a Management Information Specialist 3, the appointee will provide computer oriented specialized applications programming and systems support for the WISCOMP computer-assisted typesetting system.

QUALIFICATIONS: A bachelor's degree and two years of full-time profesional experience in data processing or management information activities. One year of experience must have involved responsibilities in telecommunications, DOS, or text editing systems. The appointee must have a working knowledge of DEC's PDP 11/45 computer and DOS software, telecommunications with VDT's, TTY, CRT typesetters and general typesetting and printing technologies, as well as skill in numerous software languages.

PAY: Between $1044 and $1164 per month depending upon qualifications. Earn $40 raise after six months.

APPLY BY: November 29, 1974. In order to expedite the filling of this position, the following schedule has been estabilished: 1) Application deadline: January 3, 1975; 2) Review of applications and notice to qualified candidates: the week of January 12, 1975; 3) Oral examination tentatively scheduled for Jauery 22 and 23, 1975. (Those candidates who reside in excess of 150 miles from Madison may receive at least partial reimbursement of expenses for participating in the oral examination.) For more information and a State of Wisconsin appilation, contact:

Department of Administration
Personnel Office, Room 113
One West Wilson Street
Madison, Wisconsin 53702
(608) 266-1524, 266-0042, 266-0068
AN EQUAL OPPORTUNITY EMPLOYER

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

IMS SYSTEMS PROGRAMMER

This challenging position offers the right person responsibility, attractive compensation, and excellent advancement opportunities in our expanding IMS environment. Applications use 200 terminals to our 158's and 168. We need IMS/V2 and ALC experience to help us convert to IMS/VS.

Please forward resume including full salary history to Mr. H. M. Heldmann, Professional Placement, Office124, Pratt & Whitney Aircraft, East Hartford, Conn. 06108

Pratt & Whitney Aircraft
U
A

An Equal Opportunity Employer, Male and Female

Systems Programmer

Work with one of the industry's most advanced Virtual Memory Operating Systems (VMOS). The environment is a central computing system, located on a new college campus, serving instruction, research and administrative users. Responsibilities include the maintenance of and enhancements to operating system software supporting time-sharing terminals, remote batch facilities, data base management systems and sophisticated user libraries.

If you have education and experience with the above activities and are willing to learn Univac's new VMOS operating system, please send resume, salary history and requirements to:

Director, Systems & Data Processing
Ithaca College
Job Hall
Ithaca, New York 14850

KUSTOM DATA COMMUNICATIONS, INC., is a growing computer system company specializing in the utilization of mini-computers (DEC) for mobile terminal applications in the Public Safety environment. Most of our systems use standardized software in a land-line and radio communications environment to provide Command and Control functions.

To meet our rapidly growing business potential, we are looking for qualified professionals who want to contribute to state-of-the-art technology. Positions are available in our Home Office as well as Regional Offices located throughout the United States.

PRODUCT MANAGER

The Product Manager, reporting to the General Manager, is responsible for configuration, installation, and support of Kustom's mini-computer based communications systems. This position provides a challenging opportunity for a disciplined individual to exert his managerial abilities in ways which will directly affect his and the Company's growth.

A minimum of eight years experience in related technical areas with at least four of these in a management/administrative position are required.

PROGRAMMER/ANALYSTS

Two to ten years experience with assembly language and real-time background in:

- Mini-computers
- Remote Terminals
- Message Switching
- Process Control
- File Systems
- Operating Systems

FIELD ENGINEERS

One to three years of hardware experience with mini-computers and peripherals. Basic radio knowledge desirable. Opportunities available for travel.

TWO-WAY RADIO TECHNICIANS

These positions involve the application of digital communications techniques in a Public Safety, two-way radio environment. A background in two-way equipment and Second Class FCC License is required.

CUSTOMER SERVICE ENGINEERS

Three to five years experience in installation of mini-computer systems. PDP II experience desirable, but not mandatory.

Send your resume to:

Don Haymaker
Personnel Director
Kustom Data Communications, Inc.
1010 West Chestnut
Chanute, Kansas 66720
Equal Opportunity Employer M/F

SYSTEMS PROGRAMMER

Implement, maintain, and assist academic users with software on a 360/65. Knowledge of OS, HASP, BAL, FORTRAN essential. Knowledge of one or more of IFT, CALL/OS, TSO, 360 to mini communications desirable. Degree preferred. Salary $11,500 up, depending on qualifications. Send resume and references to:

Director of Personnel
Wright State University
Dayton, Ohio 45431

SALES/MANAGEMENT

Full service Direct Mail organization (Washington DC) needs experienced person to assist in marketing computer letter services. Also responsible for managing small production staff. Salary open. Commission/Bonus open. Good Benefits. Must have systems background. Must be familiar with List Maintenance and computer letter production. Send resume and salary requirements to:

MASA, Box A-1
7315 Wisconsin AVe.
Suite 818 E
Washington, D.C. 20014

SYSTEMS ANALYST

Southeastern Massachusetts University has an opening for a Systems Analyst to further the development of administrative support systems in the Student Records and Fiscal areas. Our 360/40 operates for academic and administrative purposes, in batch and interactive modes. Individuals with applicable programming and application development experience are invited to submit resume, including salary requirements to:

Peter J. Kenney, Director, Computer Center, Southeastern Massachusetts University, No. Dartmouth, Mass. 02747

SMU is an Equal Opportunity/Affirmative Action Employer.

PROGRAMMER-ANALYST NCR CENTURY-ON-LINE

2-3 Yrs. Experience for dedicated On-Line/Real time applications including teleprocessing + some batch. Heavy Neat/3 Level 2 a must. COBOL helpful. 48K 101, 657, DISCS. Full responsibility for existing systems plus development and documentation of new applications. Financial Environment. Career path to management. Forward complete resume to Personnel, MONTGOMERY WARD CREDIT CORPORATION, 4 Denny Road, Wilmington, Delaware 19809

Itty Bitty Monopoly

Customer Service Engineers

We're specialists in ibm "Customer Engineer" Extractions

Salary $1300-$1800/month
5724 W. Diversey Av.
Chicago, Ill. 60639
(312) 822-7711

Bill Gill And Associates

PROGRAMMERS TELEPROCESSING

If you consider yourself competent in data communications, having experience with IBM 360/370, BTAM, BAL and MACRO languages, line and terminal control, we want to discuss job opportunities with you. Excellent salary, company paid benefits and working conditions. Please send resume in confidence including salary requirements to:

CW Box 4253
797 Washington St.
Newton, Mass. 02160

run with us

call
brian
sweny

965-5800

run with us
run with us
run with us

PROGRAMMER ANALYST

We offer a genuine opportunity to move as far and as fast as your technical competence and energy can take you. The successful candidate will have at least 3 years of experience utilizing ALC in an IBM 360 or 370 environment. Additional experience in PL-1, on line systems, banking or accounting applications is highly desirable. Interested candidates please send resume stating experience, career goals, and salary requirements, to address listed below, or call me collect to arrange a personal and confidential interview at (317) 266-5523.

John Hamilton
INDIANA NATIONAL CORPORATION
One Indiana Square, 915
Indianapolis, Ind. 46266
An Equal Opportunity Employer M/F

Programmer Analyst

Program Your Career and Advancement
With A Major Natural Resources Company

Come into the pleasant, professional atmosphere of our Knightsbridge Data Processing Center, our DP headquarters. Here you'll have a triple foundation under your career — a basic industry (forest products, paper, pulp); a leading and growing company; and a department that offers much opportunity to learn and keep moving ahead according to your interests.

This business-oriented assignment calls for 3-4 years or more in data processing, with at least a year or two in programming. Two years of college with emphasis on EDP or Mathematics is desirable, but experience will be considered primarily. A broad understanding of computer concepts is needed, with knowledge of Operating Systems, Utility Programs, and languages. A variety of projects will provide scope and exposure, with a high degree of challenge.

Good initial salary, plus excellent benefits. Please reply in confidence including salary history to Mr. Dennis Yamasaki, Employment Supervisor.

Champion International
Knightsbridge Drive, Hamilton, Ohio 45011
An Equal Opportunity Employer M/F

High-Level Computer Industry

Marketing Executive

We're looking for someone with the experience, contacts and ability to market our national computer industry trade show. You will work out of our Boston-area offices and travel extensively around the country, seeing (and selling) top-level computer industry executives at manufacturing, marketing, software and consulting companies. You'll be completely responsible for the marketing success of an established, proven product. And you'll have an excellent chance to grow.

To qualify, you must have high-level computer industry marketing experience, an excellent knowledge of the field, and the ability to work long hours traveling around the country. You must also be able to see and deal with the top executives at our client companies of all sizes.

We offer a good salary plus an excellent profit-sharing and bonus program in a small but solidly established and very successful company with a strong growth record. You'll report directly to our top people, and your efforts will be well-rewarded.

To apply, please send your resume, or a detailed letter, to:

CW Box 4252
797 Washington Street
Newton, Mass. 02160

All replies held in strict confidence.

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

Systems Programmer (Sr.)

Minimum Education: B.S. Degree in Computer Science, E.E., Math or related fields. Required knowledge – BAL. Preferred experience – OS/MVT and HASP.

Computer Environment IBM Model 168 with the VS2 Release 1.7 Operating System serving the University's four campuses in areas of Academic, Administration and Health.

Responsibility: Implement, document, and maintain user application software for the Computer Network. includes: Statistical packages, mathematical subroutines, simulation and formula manipulation packages and special compilers.

Send resume and salary history to:

University of Missouri
Personnel Services
309 Hitt Street
Columbia, Missouri 65201
(314) 882-4221
An Equal Opportunity Employer

Sales Opportunity

Technical Services

We are a growing computer mapping services subsidiary of a well established international organization. As a result of our recent growth, we have developed a need for an experienced, highly professional Business Development Representative to be part of our team. The individual we seek should have a technical background (preferably in Engineering), and be familiar with surveying and mapping. Knowledge of aerial photography, computer sciences, or mappy or land use for public utilities would be helpful.

If you seek challenge and opportunity for advancement in a unique professional environment, send your resume and an introductory latter stating salary requirements to:

CW Box 4257
707 Washington St.
Newton, Mass. 02160
An Equal Opportunity Employer

COMPUTER SYSTEMS ANALYSTS

The Social Security Administration, Department of Health, Education and Welfare, one of the largest employers of commercial data processing personnel in the country, needs Computer Systems Analysts with outstanding technical credentials in data base administration and systems software on large scale third generation computers. We are looking for professionals with demonstrated skill and experience in all or in combinations of these specialized areas:

DATA BASE ADMINISTRATION

for large online multi-user data bases utilizing advanced data management software

- Data base planning
- Data base design
- Data dictionary design
- Data administration standards
- Data base security and integrity procedures
- Data base analysis
- Data base administration
- Data base integration

OR

SYSTEMS SOFTWARE

for IBM 360/370 Operating System or UNIVAC EXEC8

- Internals of the supervisory control software, including scheduling and resource allocation algorithms.
- System generation, modification, and maintenance.
- Debugging system and COBOL application program failures (skill in use of standalone, core image, and user core dumps)
- Advanced hardware/software techniques (e.g., multi-processor, virtual systems, CPU to CPU communications multi-vendor device interconnection, system monitors)
- Creation of system macros and modules (e.g., supervisor calls, accounting routines, symbionts)
- System performance evaluation and fine tuning

These positions are located in Woodlawn, Maryland, a suburb of Baltimore, within short driving distance of the Nation's Capital and the Chesapeake Bay. Starting salaries are either $25,581 (GS-14) or $21,816 (GS-13) depending upon individual qualifications. Interested parties should forward their Personal Qualifications Statement (Standard Form 171) and Supplemental Qualifications Statement-Computer Specialist (CSC Form 972) to the address below. These forms can be obtained from any U.S. Civil Service Commission office, or by writing to us. Address responses to:

SOCIAL SECURITY ADMINISTRATION
Personnel Division, Department A
Room G-3406 West Building
6401 Security Blvd., Baltimore, Md. 21235
An Equal Opportunity Employer — M/F

TRAINING MANAGER
INFORMATION SYSTEMS
NEW POSITION!

Be a part of our growing company as we move into an all new information systems program.

Train all levels of management in basic computer concepts and coordinate all user training.

We are now installing twelve IBM 370's in a DOS/VS environment with CRT's and teleprocessing.

Your background should include: Undergraduate degree, exposure to training procedures, experience with IBM 360/370, a minimum of five (5) years in the field.

Send resume and complete salary history to:

Jerry Austin, Director of Personnel, Fleming Companies, Inc., P.O. Box 26547, Oklahoma City, Oklahoma 73125

COMPUTER SCIENCE DEPARTMENT

ACADIA UNIVERSITY
Wolfville
N.S.
B0P 1X0

Requires Assistant or Associate Professor with Ph.D. in Computer Science or related subject to teach and do research. Salry negotiable. Apply: Dr. A.A. Mufti, Head, Computer Science Department.

SYSTEMS PROGRAMMER

Expanding modern 450 bed general hospital on the SW Florida coast needs a qualified Systems Programmer for implementation of medical applications utilizing DOS/VS, CICS/VS, COBOL/VS, and BAL software on an IBM S/370 with 3270 hardware. Only those with required software experience need apply. Liberal fringe benefits provided. Send resume including salary requirements to:

D. Willard Taylor, Jr.
Manager, Data Processing
P.O. Drawer 2215
Ft. Meyers, Fla. 33902

Sales Representative

Sell for the leading independent supplier. Highly competitive, cost-effective product line — interactive and intelligent — with total systems/service backup. Excellent career-growth potential. You must have 2 to 3 years' experience in computer/terminal sales. Send resume and salary history to Timothy D. Crowe, Jr., Industrial Relations Manager, Sanders Data Systems, Inc., NHQ1-479, Daniel Webster Highway-South, Nashua, NH 03060. Systems engineers needed, too.

"an equal opportunity and affirmative action employer"

SA SANDERS ASSOCIATES, INC ...the intelligent answer

programmers ten cents will buy you a postage stamp and a bright new future

That's right! Simply mail your resume to the nearest ESP Associates office. They can show you dozens of opportunities in your own area that lead to systems and ultimately . . . management.

If you have one to two years experience, DOS or OS, 360/370, Cobol, Assembler, and with applications in manufacturing, or insurance, or banking, or financial and accounting, etc. . . . well, we can almost guarantee you a bright new future!

Not bad for a ten cent investment!

esp associates

CHICAGO
McCormick & Associates, Inc.
366 North York Street
Elmhurst, Illinois 60126
CLEVELAND
McCormick & Associates, Inc.
801 Rockwell Avenue
Cleveland, Ohio 44114
COLUMBUS
Thornewell-Delaney Associates
936 S. Broad Street
Columbus, Ohio 43206
DALLAS
Data Processing Careers
Suite 1166
Simmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1706 Fisher Building
Detroit, Michigan 48202
HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105
MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1718
Minneapolis, Minnesota 55402
NEW YORK
Botal Associates
405 Lexington Avenue
New York, New York 10017
PITTSBURGH
Electronic Systems Personnel
106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Penna. 15219
SAN FRANCISCO
The Computer Resources Group Agency, Inc.
303 Sacramento Street
San Francisco, Cal. 94111
WASHINGTON, D. C.
ESP Systems Corporation
Suite 210
1211 Connecticut Ave. N.W.
Washington, D. C. 20036

Computer personnel firms interested in ESP Associates membership, contact Stephen Weber
Compass, Inc
900 Asylum Avenue
Hartford, Conn. 06105

Allegheny Airlines Has Immediate Openings

-Programmers
-Systems Planners
-Systems Programmers

Experience in PARS (Program Airline Reservation System), IMS (Information Management System), OS (360/370), TSO (370). Positions cover broad areas and levels in Design, Application Systems and Programming. Salary commensurate with skill/ability/experience.

Attractive benefits and travel privileges, up-to-date equipment and modern work facilities. Convenient location at our Computer Center in Crystal City, Arlington, Virginia

Send resume in confidence to:

H.E. Rouson, Employment Services
Allegheny Airlines, Inc.
Washington National Airport
Washington, DC 20001

Allegheny Airlines, Inc.

America's 6th largest passenger-carrying airline
An equal opportunity employer M/F

SENIOR SYSTEMS PLANNERS

EDP HEALTH SYSTEMS

Blue Shield, a leader in healthcare innovations in Massachusetts, is expanding the professional staff of the Systems Planning Division to include a small select group of Senior Systems Planners.

These individuals will analyze present healthcare delivery systems, including manual and computerized reporting and payment systems, evaluate the impact of pending national healthcare plan options, and develop real time responses and solutions.

Here is a unique opportunity for an innovator, who has a knack for combining theory and EDP Systems Technology, to directly participate in the development of new Healthcare Systems.

Requires proven experience in analyzing healthcare systems with an awareness of the impact of pending national health insurance legislation. Diverse experience in computerized systems, languages, and hardware required, including ability to communicate effectively with users.

Excellent salary range commensurate with experience. Complete benefit program.

Please send resume, call or apply in person to Personnel Department, 2nd Floor, 100 Summer Street, Boston, Mass. 02106, 956-2091, between 8 a.m. and 4 p.m.

Blue Cross Blue Shield of Massachusetts

MASSACHUSETTS Dental Service CORPORATION

An Equal Opportunity Employer

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

EDP OPPORTUNITIES

Investigate TASC's exciting new activities in the field of EDP applications. This division of our rapidly growing applied research firm currently offers excellent opportunity for qualified individuals.

SCIENTIFIC PROGRAMMER

Challenging opportunity to solve interesting and sophisticated analytical problems. Must have a BS or MS in Math, Engineering or Computer Sciences. A minimum of 2 years actual programming experience with FORTRAN or PL/1 and familiarity with IBM 360/370 OS or VS systems is desirable.

DATA BASE ANALYST

We are seeking a flexible Programmer/Analyst with a BS or MS degree to work in commercial and data base software development. You must have a minimum of 2 years experience, be capable of writing in at least 2 computer language (including PL/1 or COBOL) and possess good written and oral communication skills. Familiarity with an assembler language and IBM 360/370 hardware would be a definite asset.

TASC is conveniently located 10 miles north of Boston. We offer excellent salaries and fringe benefits including profit sharing. US citizenship is required.

Please send your resume including salary history in complete confidence to J.R. O'Hare.

TASC
THE ANALYTIC SCIENCES CORPORATION
6 JACOB WAY, READING, MASSACHUSETTS 01867
an equal opportunity employer

MOVING?

Please notify *Computerworld* at least four weeks in advance. When writing about your subscription, please enclose a recent mailing label. The code line on top may not mean much to you, but it is the only way we have of quickly identifying your records. If you are receiving duplicate copies, please send both labels.
797 Washington Street
Newton, Massachusetts 02160

FOR SALE

TI 960A Minicomputer

- 8K Words of Memory
- Card Reader
- 100 LPM Printec Printer
- 360 Cross/Assembler and Manuals

Contact:
Davoid Estes
Gilbarco Inc.
Greensboro, N.C. 27420
Phone (919) 292-3011

AVAILABLE

Raised computer room flooring – approximately 600 sq. ft. of 24" x 24" panels, with stanchions and metal interlocking grids good condition. Also forty (40) control data #851 disk packs, for use on control data #854 disk drive.
Submit quotes to:
Itek Corporation OSD
10 Maguire Road
Lexington, Massachusetts 02173
Attn: Paul Zeved
Property Administrator
(617) 276-2485

LEASES WANTED

2-360-20/5 or 6 (1-2 years)
1-370-135 (2 years)
Contact J.K. Henley for RFP copies.
AT&T-Long Lines
445 Hamilton (14th Floor)
White Plains, N.Y. 10601
(914) 320-3926/3650

SUPER BUY
Itel 1051 Terminals

Paper tape input and output with hard copy from IBM Selectric typing element. On line capability. Brand new.
Have twenty machines perfect for your application available at 25% of original cost. Contact: Mr. Bryant.
COMPU-LINK CORPORATION
4000 N. Grand River Ave.
Lansing, MI 48906
(517) 372-4750

UNIVAC

Uniservo 12 Tape Unit
Control Unit
Master and 3 Slaves
Eligible for Univac Maintenance

EVERGREEN COMPUTER AND FINANCIAL, INC.

CORPORATE HEADQUARTERS:
One Appletree Square
Bloomington, Minn. 55420
(612) 854-2096

8150 Leesburg Pike
Vienna, Va. 22180
(703) 790-1656

COMPUTER INSTALLATIONS TAPE

- CLEANING
- CLEANING-EVALUATING
- COMPLETE LIBRARY MAINTENANCE

WE SELL OR LEASE

- TAPE CLEANERS
- TAPE EVALUATORS
- SMS-MESSAGE DISPLAYS
- SMS-CRT DISPLAY TERMINALS
- SMS-LABRL PRINTERS

NO JOB IS TOO SMALL. PRICE QUOTES AVAILABLE BY PHONE.
CRYSTAL INDUSTRIES INC.
5408 Silver Hill Rd.
Suite 401
Suitland, Md. 20023
(301) 420-1270

360/20's
FOR SALE

All configurations available 30-60 day delivery. Call or write for a quote.
"The small systems specialist"
(901) 767-9130
SELL LEASE TRADE BUY
ECONOCOM, INC.
P.O. Box 171118
Memphis, Tenn.
Member Computer Dealers Association

WANTED
MOHAWK 9160 OR 7160

OFF-LINE PRINTER SYSTEM
Needed By: Feb. 1, 1974
3 P.M. Inc.
Contact: Bob Yanover
(313) 354-2334

Buy Sell Swap

SYSTEM 3 MODEL 6

16K Central Processor
5213-3 Printer
5444 Disk Drive
Available Now - For Sale or Lease
Computer Sales, Inc.
601 Office Park Plaza
Oklahoma City, Okla. 73105
Oklahoma City 405/848-8681
Houston 713/444-0246
St. Louis 314/727-7010

WANTED
ALL 360 SYSTEMS

360/30 1401 1440 2311 360/25 360/20 360/40

CORPORATE COMPUTERS, INC.
115 Mason St., Greenwich, Conn. 06830 (203) 661-1500
Member Computer Dealers Association

FOR SALE
NCR 200 32K DISK&TAPE

No Reasonable Offer Refused
Available 90 Days
Retail Computers, Inc.
40 Hertz Way
Secaucus, N.J.
(201) 348-3559

B-5500

Excellent Value
Principals Only
(212) 747-0670

DISK
IBM 2314 A1

Control Unit & Up to 7 Drives
Will Sell or Lease
— Available Now —
Call for other Big Savings
Computer Sales, Inc.
601 Office Park Plaza
Oklahoma City, Okla. 73105
Oklahoma City 405/848-8681
Houston 713/444-0246
St. Louis 314/727-7010

FOR SALE OR LEASE
Univac 9400

[illegible]
[illegible]
[illegible]
1600 LPM PRINTER
Will Take Your Computer In Trade

L&A Computer Industries, Inc.
Fox Hill Office Park • 10955 Granada
Overland Park, Ks. 66211 • (913) 381-7272

For Sale By Owner
HP 2000E Timeshare System

3 Months Old. Available January 1975.
Contact: Robert W. Kremling
Custom Computer Timesharing
1650 L Street
Fresno, CA 93721
(209) 268-4548

360/20

Disk—Tape—Card
Buy—Sell—Trade—Lease
Specialists in Model 20
CMI Corporation
23000 Mack Avenue
St. Clair Shores, MI 48080
(313) 774-6500
TWX 810-226-8708
Member Computer Dealers Assoc.

CALL OR WRITE
Leasing Dynamics Inc.
Mr. Tom Cutter
1717 E. Ninth St.
Cleveland, OH 44144
(216) 667-0100

WANT TO BUY IMMEDIATELY
IBM 1130 Computer
And Related Peripherals

Opportunities Knock Here.

Computerworld Classifieds could hold the key to your next office.

FOR SALE
NCR-500

Model 590-4 Console, Processor-Model 517 .4K Memory, Ledger Reader-Model-586. Sale of this machine includes all programs that we have for this machine. If interested call or write:
Ouachita Hospital
Manager of Data Processing
P.O. Box 767
Camden, Arkansas 71701
(501) 836-8323

MOVING?

Please notify *Computerworld* at least four weeks in advance. Include both old and new addresses. When writing *Computerworld*, please enclose a recent mailing label. The code line on top may not mean much to you, but it is the only way we have of quickly identifying your records. If you are receiving duplicate copies, please send both labels.

COMPUTERWORLD, *797 Washington St., Newton, Mass. 02160*

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

360/370
COMPUTER WHOLESALE CORP.

UNIT RECORD DEALS.
Don't Make One Without Calling Us
1. No one (except IBM) has a bigger inventory
2. All types—instant delivery
3. Reconditioned, as is, or certified for IBM M. A.

BUY, SELL, SWAP
Call Warner Rivera at (212) 557-3712
GENESIS ONE COMPUTER CORPORATION
300 East 44th Street, New York, New York 10017

BUY, SELL, LEASE, TRADE
IBM COMPUTERS AVAILABLE
All configurations: 1401's, 360/20's, 30's, 40's, 50's, and 65's, 370's, and System 3's. All peripherals.
All models unit record equipment available completely refurbished and under IBM M/A. Certified disk packs available.
Contact: Don Norris or Jack Lowey
Data Automation Co. Inc.
4858 Cash Road, Dallas, Texas 75247
(214) 637-6570 Call Collect
"Member Computer Dealers Assoc."

360 Model 40
AVAILABLE FOR IMMEDIATE LEASE
Any core size, CPU only or complete system including I/O set
For an immediate quote call
Sid Whiting, Director of Marketing
(201) 569-3838
Diebold Computer Leasing, Inc.
177 N. Dean Street
Englewood, New Jersey 07631

We Need: *Urgently* 1403-MOD.II 360/40-H
BUY SELL LEASE FOR BETTER VALUE LOOK TO:
Available: 1419 MOD. I Avail. 60 days
cac COMPUTER ACQUISITIONS COMPANY
P.O. Box 80572 Atlanta, Ga. 30341 (404) 458-4425

PAYMASTER II
the finest comprehensive payroll system available today, features:
- *exception basis input
- *multiple pay frequencies
- *hourly/salary/piecework/commissions
- *labor & tax distribution/analysis
- *personnel system
- *job costing
- *multiple State taxes/employee
- *complete tax maintenance
- *monthly accrual/reversal
- *powerful "report writer"
- *Workmen's Compensation
- *check reconciliation
- *S.U.I./F.U.I.
- *ANS COBOL

IBM DOS/VS & O/S; Honeywell MSR & O/S 2000
"MONTHLY LICENSE-TO-USE" or "PURCHASE"
Also available: Accounts Payable & Canadian systems
COMTECH
Comtech U.S.A. Inc., Box 784, Reston, Virginia 22070 (703) 471-7141

System 3/10
Complete IBM Installation
— Available Now —
Save over $15,000.00
Plus Free
Delivery and Installation
5410 A2 8K CPU
5203 2 Printer
5424 A1 MFCU
5496 1 Data Recorder
5486 1 Card Sorter
Computer Sales, Inc.
901 Office Park Plaza
Oklahoma City, Okla 73105
Oklahoma City 405/848-8851 — Houston 713/444-0248
St. Louis 314/727-7010

IBM 360/370 SYSTEMS
Add-on Core for sale
The Computer Place
(216) 526-2080

360/370
BUY-SELL-LEASE
Call or Write
George S. McLaughlin Associates, Inc.
180 Morris Avenue
Summit, N.J. 07901
(201) 273 5700
Member Computer Dealers Association

Carterfone
Carterfone Needs to Buy...
your new or used
Teletypewriters: 33ASR, 33KSR, 32ASR and 32KSR.
We're paying top prices!
If you own this equipment, please contact Bud Scott immediately at (214) 350-7011.
Or write Carterfone Communications Corporation, 2639 Walnut Hill Lane, Dallas, Texas 75229.

WANTED
BURROUGHS L SERIES
TC 500 and TC 700
NCR 31 — 32- 41 - 42 - 481 - 482 - 450
IBM Unit Record Machines
84 Kennedy St.
Hackensack, N.J.
07601
(201) 342-4584

SALE OR LEASE BY OWNER
3155-PROCESSOR
WITH OR WITHOUT
VIRTUAL OPTION
AVAIL. JAN. 1975 - IBM OR AMS MEMORY
THOMAS COMPUTER CORPORATION
600 MC CLURG COURT SUITE 2807
CHICAGO, ILLINOIS 60611 (312) 944-1407

-SALE- 360/65 -LEASE-
SYSTEMS AVAILABLE
1130
360/20
360/30
360/50
370/155
ECONOCOM, INC.
Subsidiary of Cook Industries Inc.
855 Ridge Lake Blvd.
P.O. Box 171116
Memphis, Tennessee 38117
(901) 767-9130
I/O AVAILABLE
2401-5's
2401-6's
2501-B2
2520-B2
I/O Sets
"MEMBER COMPUTER DEALERS ASSOCIATION"

IBM 360/44 FOR SALE
AVAILABLE MAY 1, 1975
- 128K
- Commercial Feature
- Storage & Fetch Protect
- Floating Point
- One High Speed MPX Channel
- One Low Speed MPX Channel
- Second Single Disk Storage Drive
- Under IBM Maintenance

Director of Data Processing
SAVANNAH FOODS & INDUSTRIES, INC.
P.O. Box 339
Savannah, Ga. 31402
(912) 234-1261

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

IBM 1130s

Complete systems available for sale or lease at attractive rates.

Expanded disk and printer capability.

Ideal for small company business/technical requirement, terminal/stand alone network, or educational and municipal applications.

Multi systems available immediately and throughout 1975.

Please contact: R.O. Doherty

Computer Systems of America, Inc.
141 Milk Street, Boston, Mass. 02109
(517) 482-4671

DATA PRINTER CORP.
MODEL V132
600 LPM - 132 Column
Used 1 Year
Excellent Condition
MAKE OFFER

DATASERV
ONE OF THE PURDY GROUP OF COMPANIES
770 AIRPORT BLVD.
BURLINGAME, CA 94010
(415) 342-0877

WHEN BUYING OR SELLING
GO GREYHOUND

GREYHOUND COMPUTER CORP
Greyhound Tower
Phoenix, Arizona 85077

370/135 144K
370/135 512K
360/30 65K Loaded
1130 Comm. feature [illegible]
CDC 2314
2415 MODELS 1, 2 and 3
I/O Set 1403 N1, 2540, 2821
UNIVAC 9300 Any Size
UNIVAC TAPES AND DISCS

L&A Computer Industries, Inc.
Fox Hill Office Park • 10955 Granada
Overland Park, Ks 66211 • (913) 381-7272

Leasing Dynamics Inc.
1717 E. Ninth St.
Cleveland, OH 44114
216-687-0100

WANTED
IBM 1130 System

FOR SALE/LEASE
IBM 2361 LCS Core

IBM UNIT RECORD EQUIPMENT | IBM COMPUTERS

024	083	402	523
026	084	403	548
029	085	407	552
056	087	408	557
077	088	514	602
082	089	519	604

We Buy, Sell or Lease
360 - 20
System 3
1130

Special Sale
029's
All Models

Big Savings [illegible] on Short Term Rental
Call us for all your needs. We buy, rent and sell [illegible] IBM unit record equipment. Over 12 years of serving commercial [illegible] requirements. All equipment rebuilt at our own factory and guaranteed for IBM MAINTENANCE. Contact John Fennell V.P. for proposal 212 689 4747 Cable Leasatron, New York Telex 423857 LMC UI 116 East 27th Street New York New York 10016

LMC Data Inc

2-2319 (AOI)
FOR SALE
IBM M.A.

P.C.M. Corp.
2636 Farrington
Dallas, Tex. 75207
(214) 637-0950

SYSTEMS 70, INC.
DATA PROCESSING EQUIPMENT SPECIALISTS
2200 E. DEVON AVE., DES PLAINES, ILLINOIS 60018 (312) 827-8135

360/370
buy · sell · lease · trade

FOR SALE

"NEW" DATA PRODUCTS PRINTERS
DP 2470-1250 LPM $9500

IBM 1130-Bi-Sync 360/20-360/40
HIS 200/2000
UNIVAC 1108-II
MRX 40-$37,500
COMPLETE SYSTEM
MINIS/PERIPHERALS

UNIVAC
- 1108-II System or Units
- 196K, Card I/O Printer
- (10) VIIIc Tapes, FH, CTMC
- 1004 & 9200 RJE
- 9200 Systems or Units
- 1004 & 1005 Tape Systems
- 418-II CPU, Memory

(617) 261-1100
AMERICAN USED COMPUTER CORPORATION
P.O. Box 68, Kenmore Station, Boston, MA 02215
Member Computer Dealers Association

SYSTEM 3

IBM SYSTEM/3 MODEL 10 Available Immediately Call or write for details.

"The small systems specialist"
(901) 767-9130

SELL LEASE TRADE BUY

ECONOCOM, INC.
P.O. Box 171116
Memphis, Tenn.
Member Computer Dealers Association

WANT TO BUY

System/3
System/3
System/3

Will consider any configuration or availability date.

Contact Bob Johnson
CALL: 612-546-4422

dataserv
equipment inc.
400 Shelard Plaza, Suite 415
Minneapolis, Minnesota 55426
Member, Computer Dealers Assoc.

RECESSION FIGHTERS

WE HAVE AVAILABLE

370/165K sale/lease March 1975
370/158J1 2 Yr lease May 1975
370/155J W/DAT
sale/lease March 1975
370/145IH2 sale/lease March 1975
370/65J sale/lease January 1975

WE NEED

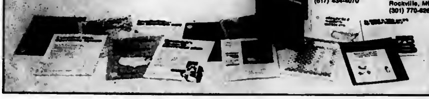
360/50H Now
360/65IH February 1975
370/155I January 1975

Call Bill Rummler

EVERGREEN COMPUTER AND FINANCIAL, INC.
Member of Computer Dealers Association
CORPORATE HEADQUARTERS:
One Appletree Square
Bloomington, Minnesota 55420
(612) 854-2000

Computer leasing by the book.

Find out about Randolph's approach to computer leasing . . . customer services, DOS support, systems performance monitoring, conditional sales, system upgrades, installation practices, and more . . . in our new 4-color brochure. Call or write your nearest Randolph office today!



Northeast
537 Steamboat Road
Greenwich, CT 06830
(203) 661-4200
(212) 931-1177

Box 1963
100 Federal Street
Boston, MA 02105
(617) 434-4070

621 Country Club Road
Avon, CT 06001
(203) 673-0435

20 Cornell Place
Englishtown, NJ 07726
(201) 446-6300

Mideast
6110 Executive Blvd.
Rockville, MD 20852
(301) 770-6266

Southeast
First National Bank of Boston
Suite 2105
260 Peachtree St. NE
Atlanta, GA 30303
(404) 688-6932

Midwest
8050 Hosbrook Rd.
Cincinnati, OH 45236
(513) 793-6060

625 North Michigan Ave.
Chicago, IL 60611
(312) 787-4224

Southwest
1545 W Mockingbird Lane
Dallas, TX 75235
(214) 637-3680

3311 Richmond, Suite 200
Houston, TX 77006
(713) 526-6879

West
One Wilshire Blvd.
Los Angeles, CA 90017
(213) 680-6166

525 University Ave.
Palo Alto, CA 94301
(415) 327-2780

530 "B" Street
San Diego, CA 92101
(714) 232-6401

RANDOLPH COMPUTER COMPANY
Division of Firstbank Financial Corporation
A subsidiary of the First National Bank of Boston
Member of Computer Lessors Association

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

WANTED

SALE OR LEASE

with I/O set

6600 system

with I/O and di

Computer • Don Bell • 989 6580

GET IT TOGETHER

SOFTWARE SUPPORT WITH YOUR COMPUTER LEASE FROM THE WORLD'S LEADING INDEPENDENT SOFTWARE COMPANY.

ALL AVAILABLE IMMEDIATELY WITH I/O SET:

• 360/75J • 360/40H • 360/50 I

CALL STEVE ELIAS AT (213) 678-0311 OR WRITE TO:

CSC
COMPUTER SCIENCES CORPORATION

TLW

360-370 market place

BUY SELL LEASE

TLW COMPUTER INDUSTRIES INC.

ATLANTA: 3670 American Drive, Atlanta, Ga. 30341
404-461-1896 TWX 810-757-3654
CHICAGO: 312-295-2030
SAN FRANCISCO: 408-249-0110
LOS ANGELES: 213-373-6826

KEYPUNCH SALE

Immediate Availability
029 as low as $1895.00
026-056-059-1701-1710

NEED TO BUY

Teletypewriters 33 ASR-33KSR
32 ASR-32KSR, All types
terminal equipment
Deta Rentals/Sales Inc.
2919 S. La Cienega Blvd.
Culver City, Calif. 90230
(213) 559-3822

THIS COSTS YOU MONEY

DOLLARS IN CAPITAL EQUIPMENT NOT IN USE.

TURN YOUR LOSS INTO USABLE DOLLARS.

WE WILL BUY OR RECONDITION YOUR TELETYPE MODELS: 28-32-33-35-38

A.D.M. COMMUNICATIONS
1265 Simpaon Way
Eacondido, Calil. 92025
(714) 747-0374

FOR SALE

NCR

CENTURY-101

32K memory w/I-O writer
58 mb—657 disc
300cpm—Cot card reader
450/9001lpm—640-102 Printer
ALSO
622-201 Kaytepe Controller
736-301 (Mohawk Model 6401)
735-801 (Mohewk Model 1183)
w/selectric printer
CW Box 4254
797 Washington St.
Newton, Mass. 02180

Used

- 360/370 compatible core
- 2314 plug compatible disk drives
- 2401, Model 4, 5 & 6 plug compatible tape drives.

End user or manufacturers only. No brokers or leasing companies. Call:

Datronic Rental Corp.
Sam Guccione, V.P.
(312) 992-0760

FOR SALE

System 3/10
64K CPU S/N 12996

Features
3500, 3901, 3902, 3971, 4101, 4110, 4501, 4502, 5732, 5733, 6378, 7951 8642, 2074, Int Timer

5471 Printer/Keyboard s/n 21478

Alao — 5203-2 Printer s/n 12952
Features: *5560 and 8639*

Available immediately • Features can be sold separalaly • Will trade for a smaller CPU

data sales co.

13200 Penn Ave So
Burnsville, Minn 55337
(612) 890-8838

1009 No Jackson,
Milwaukee Wisc 53202
(414) 273-2700

IBM System 3/6 Sell or Rent (212) 747-0670

FOR SALE
IBM 370/135 Computer
Aveilabla March 1, 1975

Two yaers old. IBM maintainad. 3135-DHO 240K CPU with 4640, 4650, 4655, 4722-3-4-5, 4668, 6981, 7855, 7861, 7862, 8637, 3046-01, 3215-01. Will sell for 77% of IBM price of $630,935. Please contact:

Ted Boscta
The Dow Chemical Co.
P.O. Box 1388
Pittsburg, Calif. 94565
(415) 432-7311

IBM 1130 COMPONENTS

2—No. 1133 Multiplexor Control Encloeurea. Both Have No. 1865 Chennal Multiplexora end No. 3201 Diak Control I. One Hea No 4423 1403 Attachmant.

2—No. 2310 B1 Diak Storaga Drivaa, ell under I.B.M. Maint. Agreement and Available Immediataly.

Call or Write Owner:
THE STATE JOURNAL
Lansing. Mi 48919
1—517—485-3211
ATTN: Ron Hertgarink

MINI-COMPUTERS

Buying? Selling? Let us do the work for you and save you time and money!

Availabla Now:
—New Nova 2's (15-20% off list), Jumbo 1200, 1220, 820
—PDP 11/05, 11/15, 11/20, 8E (New), 12
—Printers: Dete Products 2440, LP11, Versatek
—Wang 720
—HIS 316
—Hazeltine 2000
—RK8EA
And meny ohters — CPU's end Systems

Wanted to Buy:
RK-11, RKOK, TM11, TU10, Nove 1200, DCC D116, PDP 8E, 11/35, 11/45

MINI-COMPUTER EXCHANGE
(408) 733-4400
TWX 910-339-9272

SELL or LEASE

360/65 IH **2870-1**
2860-3 **2365-2**

BAY AREA COMPUTER CORPORATION

415 944

BM EQUIPMENT SPECIALISTS IN THE WEST

For Sale or Lease

32K Cork Pak 22 3/2311 Mod 1 Disk Drives, 1/2841 Control Unit.

No Reasonable Offer Refused

T.J. Machado
2010 Webster St. #300
Oakland, CA 94612
(415) 834-8242

IBM

UNIT RECORD EQUIPMENT
Buy — Sell — Equity Lease
026 056 082 077 514 522 402
029 059 083 085 519 548 407
Also Other IBM Punch Card Equipment.
1620 & 1130 Components or Systems
Guarenteed Eligible for IBM M/A
Immediate Delivery
Payment Plana to fit your Budget
CALL COLLECT
CMI Corporation
23000 Mack Avenue
St. Clair Shores, Michigan 48080
(313) 774-9500
TWX 810-228-9708

FOR SALE/LEASE

IBM 360/65-J
2860 II
1052
up to 4 meg. core
2870 Separately
Available Immediately

FABRI-TEK INCORPORATED
5901 So. County Road 18
Minneapolis, Minnesota 55436
612/935-8811 Ralph Hawes

DPF INCORPORATED DPF INCORPORATED DPF INCORPORATED

BUY·SELL·LEASE·TRADE

Wanted IBM System 370's
Available: IBM Systems 360/370

Special Offerings:
2030 Print Station
2302 Disk (Mod 4)
2303/2841 Drum, Control
2702 Communications CU
2844 Aux. Disk Control

dpf
DPF INCORPORATED
141 Central Park Avenue South
Harlsdele, New York 10530
Write or call: Norman Usher, Director ol Brokerege, (914) 428-5000

DPF INCORPORATED DPF INCORPORATED DPF INCORPORATED

370/155 Sale - Lease 360/65

370/145 H—February Lease
360/65, 2860-3, 2870-1 Now
360/40 G—Avail. Feb. 1, 1975
360/50 H—3 Year Lease/Purchase
1419 Reader Sorter
I/O Sets for Sale

2200 East Devon Ave.
Des Plaines, Ill. 60018
312-297-3640

COMDISCO

2777 Summer St.
Stamford, Conn. 06905
203-359-4814

Buy • Sell • Lease • Trade • Sub-Lease

• TWX 910-233-2478 •
Member Computers Dealers Association

BUY SELL SWAP

1401

Card, Tape & Disk Systems Available

CMI Corporation
23000 Mack Avenue
St. Clair Shores, MI 48060
(313) 774-9500
TWX 810-226-9708
Member Computer Dealers Assoc.

COMPUTER EQUIPMENT AVAILABLE IMMEDIATELY

BURRDUGHS E-6000 Business Machine w/line printer, magnetic stripe posting console, 80 column card reeder and auto ledger reader. Also available L-2000 w/tape reader, A-149 keypunch w/interface to L-2000 and 80 column card sorter.

To submit bid or for additional information call or write:
St. Joseph Hospital
297 Center St.
Bangor, Maine 04401
Attn: DPMGR J. Ktrouec
Tel: 947-8311

FOR SALE-MINI COMPUTERS

NEW 60 MEGABYTE DISK AND CONTROLLER FOR NOVA

3-Lear Sigler 7700 A CRTs Rebuilt $1,500 ea. 10-New and Used Hazeltine 2,000 CRTs CPU's PDP 11/05 PDP 11/45 Nova 1200 Nova 840

WANTED
DEC & NOVA CPU's

Tape Drives & Controllers, Disc Drives & Controllers, Full Systems or Peripherals Call or Write:
DATALEASE CORPORATION
6430 Sunset Blvd.
Los Angeles, CA 90028
(213) 461-4688

FOR SALE BEST OFFER

IBM 2841-3t281, Model 1 Disc Control Unit With Cables

All offers received at Mt. Hood Community College up to but not later than Feb. 14, 1975 will be considered.

All moving and transportation expenses will be the responsibility of the purchaser.

Equipment eligible for IBM maintenance.

Mt. Hood Community College district retains the right to reject any and all offers.

Contact Virginia J. Vest
Purchasing Agent
Mt. Hood Community College
26000 S.E. Stark St.
Gresham, OR 97030

FOR SALE

NCR 315-100, 20K; 5 tape drives; 33KCB; 1000 LPM printer, 132 characters; paper tape punches and reader; 2-IBM 129 card punches;

Contact: Jefferson Bank & Trust
P.O. Box 15008
Lakewood, CO 80215
Call (303) 233-6561
Ext. 318 or 368

MAGNETIC TAPE

	1600 BPI recertified	800 BPI uncertified
2400	$6.00	$3.50
1200	5.00	3.00
seals	thinline	thickline
IBM	Memorex	Scotch

released from GEOPHYSICAL Archives not work tapes
(713) 772-5557 C.A.R.D.
7575 Bellaire Blvd.
Houston, Texas 77036

One L5000 Burroughs magnetic record machine for sale by the owner.
Please contact:
Fred Luleff
Hen House Interstate, Inc.
311 N. Lindbergh Blvd.
St. Louis, MO 63141

BUY SELL SWAP

IBM 370/145

- Immediately Available
- 256K
- Short Term Lease

Contact: Larry Goichman
Alanthus Corporation
(914) 428-3703

alanthus

PROFESSIONAL COMPUTER DEALERS IN THE WEST

SMI

SYSTEMS MARKETING, INC.
Phoenix, Arizona
Bob Russell
(602) 248 0457
Telex 667 334
John Detrick
(714) 832 1525

FOR SALE OR LEASE

024-$350; 026-$1300;
047-$2700; 056-$250; 077-$550;
082-$900; 063-$2300;
085-$1400; 088-$3300;
188-$16,000; 402-$1300;
403-$1400; 407-$3300;
514-$900; 519-$1300;
526-$2200; 548-$2000;
552-$1400; 557-$3700;
602-$400;
729 (6) $1600
1401-4K System-$11,000

Member Computer Dealers Assocation
THOMAS COMPUTER CORPORATION
Suite 3807A
600 N. McClurg Court
Chicago, Illinois 60611
(312) 944-1401

BUY • SELL RECONDITION

•TELETYPE® EQUIP •MODEMS
•PRINTERS •CRT TERM
•COUPLERS •ACCESSORIES

WE BROKER EQUIP.

vardon & assoc. inc.
930 N. Beltline Rd.
Irving, Texas 75061
214-252-7502
TWX 910-860-5761

SYS/3 – MOD10
SALE OR SUBLEASE

16k C.P.U.
5444 Disk 4.9/m Bytes'
5445 Disk Attachment
5424 MFCU & Attachment
5203 Printer Attachment
4765 Local Comm. Adapter
30-Day Availability

Call: Nelson Powell
(703) 981-9394
Radiology Assoc., Inc.
2105 Crystal Spring Ave., SW
Roanoke, Va. 24014

BUY-SELL-LEASE

WE WANT TO BUY

All model 360/20's, 360/30's 40's, 50's, and 65's. 370's and System 3's. All peripherals and unit record equipment.

FOR SALE

CALCOMP DISKS
CO-14 and 4-CO12's
360-30-64K CPU
2803-2 and 6-2401-5
2821-1 and 1403N1
CDC-6600
UNIVAC-1108
1401 SYSTEMS
Longhorn Computer
3131 Turtle Creek
Dallas, Texas 75219
(214) 522-3170

BUY SELL SWAP

1130's
FOR SALE

All configurations available 30-60 day delivery. Call or write for a quote.

"The small systems specialist"
(901) 767-9130

SELL LEASE TRADE BUY

ECONOCOM, INC.
P.O. Box 17116
Memphis, Tenn.
Member Computer Dealers Association

370/155

S/N 10389
Immediate Delivery

with or without DAT and regular or accelerated memory. Sale or long-term lease 3360-3's & 3830/3330's and other I/O also available

IPS

IPS Computer Marketing Corp.
(201) 871-4200

Leasing Dynamics Inc.
1717 E. Ninth St.
Cleveland, OH 44114
216-687-0100

FOR SALE

MOHAWK: Line Printer
7 & 9 Channel Keytapes
Sale/Rent/Lease

155

For Sale
Immediate Delivery
By Owner:
IPS Computer Marketing Corp.
(201) 871-4200

2703 (01)
1440-2
7505-10
4686
4619

FOR SALE
IBM M.A.

P.C.M. Corp.
2636 Ferrington
Dallas, Tex. 75207
(214) 637-0950

We buy, and sell and install

New and Used Computer Room Flooring

Please write or call
Raised Floor Installation
19 Sebago Street
Clifton, N.J. 07013
(201) 778-2444

WANTED

TELETYPE®

Models 32 · 33

NATIONAL TELETYPEWRITER CORP.
207 Newtown Rd.
Plainview, N.Y. 11803
(516) 293-0444

BUY SELL SWAP

IBM 360/370
UNIVAC • CDC HONEYWELL

Flexible plans, low rates, fast service on systems & peripherals.

CALL US

WASHINGTON	(703) 521-2900
NEW YORK	(201) 571-1590
PITTSBURGH	(412) 921-3077
ATLANTA	(404) 393-1309
CHICAGO	(312) 343-0406
ST. LOUIS	(314) 578-4741
KANSAS CITY	(515) 471-7376
DALLAS	(214) 537-5010
HOUSTON	(713) 447-0325
LOS ANGELES	(714) 645-3712
SAN FRANCISCO	(415) 928-7202
PORTLAND	(503) 297-4721
HAMBURG	040 50 30 21
GENEVA	022 51 27 54
PARIS	788 12 40

CLC Computer Leasing COMPANY
2001 Jefferson Davis Hwy., Arlington, Va. 22202
Brokers Inquiries Invited
Member: Computer Lessors Association

I/O SETS AVAILABLE IMMEDIATELY

$78,000
(Will Also Lease)

Contact: Harry Blair
Computer Installations Corp.
(713) 524-1401

NEEDED NOW

370/145's
370/155's
370/158's

CROSS COMPUTER CORP
• BUY • SELL • LEASE
(516) 487-9812
505 Northern Blvd.
Great Neck, N.Y. 21621
TELEX 12028

IBM 1401 WITH 1311 DISK

For Sale
Also 729 Tape Drives

D.P. Equipment Marketing Corp
260 W Broadway N Y N Y
CALL (212) 925-7737 Ext 1

---

360 Model 50

AVAILABLE FOR IMMEDIATE LEASE

Any core size, CPU only or complete system including I/O set
For an immediate quote call
Sid Whiting, Director of Marketing
(201) 569-3838

Diebold Computer Leasing, Inc.
177 N. Dean Street
Englewood, New Jersey 07631

WANTED

BURROUGHS
L SERIES

I.O.A. Data Corp

BUY SELL SWAP

ACS

FOR SALE

65K 1.5u
MODEL 30 SYSTEM
COMPLETE WITH I/O SET
AND 5/2311's
6K MODEL 20
W/2203 AND 2560

Member Computer Dealers Assoc.

360/370 System/3

CPUS & PERIPHERALS

Buy . Sell
Lease . Trade

CALL: 612-546-4422

dataserv
equipment inc.
400 Shelard Plaza, Suite 415
Minneapolis, Minnesota 55426
Member, Computer Dealers Assoc.

Time for Sale

ILLINOIS

IBM 360/370 USERS
COMPUTER TIME AVAILABLE

370/158
2 meg, 3330 (32m), 2314 (16m), 12 3420-S d.d. tape OS/VS2, RJE, TSO, ATS, DDS emul.
24 Hours — 7 Days

370/155
2 meg, 3330 (16m), 2314 (6m), 12 3420-S d.d tape

370/135
240K, 3330 (4m), 2314 (6m), 6 3420-S d.d. tape

370/135
144K, 2314 (6m), 6 3420-S d.d. tape

FOR FURTHER INFORMATION
JIM WHITELEY
(312) 346-1331

computer research company
200 N. Michigan Avenue
Chicago, Ill. 60601
Largest Computer Time Sales Co.

370/155 2 MEG
Full Shift A Day
Hands On or R.J.E.
OS/DOS

370/158
OS/VS 2 Hasp
ASK ABOUT A FREE TERMINAL

XEROX 1200
Processing

370/135
3330's and 2314
OS/DOS VS
Full Shift
Over 200 Systems
To Pick From

Call or Write:
FRANK ORLANDO, JR.
(312) 346-1331
200 N. MICHIGAN AVE.
CHICAGO, ILL. 60610

TIME FOR SALE

ILLINOIS

HONEYWELL
131K – H2200
All Shifts Available
OS 200/2000 or Mod 1
8 tape drives – 2 discs
2 cd. rdrs-PPT rd & pnch
1350 LPM Printer
Office space & storage
Business Mailers, Inc.
640 N. LaSalle, Chicago, Ill.
(312) 782-4126

N. & S. CAROLINA

IBM 360/370 Users
Computer Time Available
370/158 - DOS & OS Time
Local & Remote Batch
On-Line Interactive
24 Hours - 7 Days
Network Computing Corp.
4827 Park Road
Charlotte, N.C. 28209
(704) 525-8810

NEW JERSEY

I.B.M. - 360-30
All shifts available
65K, 5 - 2401 Mod-2 9 track
2 - 2401 Mod-2 7 track
4 - 2311, 1403-N1, 2540
Prices start at $35.00 per hour.
We also offer complete processing services. Configuration can be modified to accommodate any 360 computer user. We have on-site CE's.
UCS Computer Centers
Route 80
Dover, N.J. 07885
Contact Bill Karsey at
(201) 381-8800 or
Sam Amoresano at
(201) 381-8801

NEW YORK

I.B.M. - 360-30
All Shifts 65K, 4-2401 MOD-2,
3-2311, 1403-N1, 2540,
1401 Compatibility
From $35.00/Hour
Restaurant Associates Ind.
1540 Broadway bet. 45 & 46th St.
New York, New York 10036
Contact:
Al Palmo at (212) 974-4966
Elliott Musikoff at (212) 874-4887

370/158
VS2-HASP/RJE, TSO
DOS Emulation
Disks-(18) 3330, (3) 2319
Tapes-(16) 3420 mod. 7
Printers-(5) 1403, (1) 3211
Excellent Technical Support
Very attractive rates on all shifts
Contact: Stu Karlevsky
(212) 584-3030
Datamor
132 West 31 St.
New York, N.Y. 10001

COMPUTER TIME
ALL SYSTEMS
360/30 65K
Midtown Location
From $25 per hour
The Service Bureau that gives a damn!
ANCHOR COMPUTER, INC.
(516) 785-1788 (24 Hours)
(212) 697-4660

TIME FOR SALE

NEW YORK

COMPUTER TIME
AVAILABLE
ALL IBM SYSTEMS
PRIME SHIFT

LANCASTER
DATA INC
212 586-4884

Thomas National, Inc.
1775 Broadway, N.Y.C.
370/158
DATACENTER
OS-VS – RJE
And Other Communications
Automated Photo Composition
DOS Emulation
3330's and 2314's
Systems and Programming Support
Data Entry Services
Convenient 57th St. Location
Open 24 Hours Per Day
Call (212) 765-8500

TEXAS

HONEYWELL
6000 SYSTEM
****
Entire Second
or Third Shift
131K words core, both disk and tape, GCOS operating system Datanet 30 front end.
Machine Equipped For
– Local Batch –
– Remote Batch –
– Timesharing –
Contact: Jim Buren
(713) 528-6361
P.O. Box 13089
Houston, TX 77019

Software
for Sale

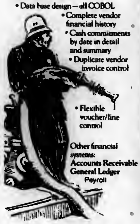
System/3
General
Ledger

• Financial data base
• Any chart of accounts
• Report Writer
• Allocations
Get MORE from your System/3
SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810
(617) 475-5040

SOFTWARE FOR SALE

PAYROLL PERSONNEL
—All COBOL-48K or above
—Variable or fixed input
—Disk or tape-IBM or others
—State and local taxes
30 Day Free Trial
50+ Users • Only $1960
• Mail-All List/Ltr Sys $880
• Super/Cobol Prog. Gen. ..$880
• PLS-Prog. Lib. Sys. $2000
• TIM-Tape Inven. Mgr. ...$750
• Super/Doc Doc. Sys. ...$2880
• Call (213) 753-5144 for a software catalogue ...
Occidental Computer Systems, Inc.
11311 Camarillo Street
North Hollywood, Calif. 91602

MMS
Accounts Payable-II
Keeps The Well
From Going Dry!
Exclusive features:
• Data base design – all COBOL
• Complete vendor financial history
• Cash commitments by date in detail and summary
• Duplicate vendor invoice control
• Flexible voucher/line control
Other financial systems:
Accounts Receivable
General Ledger
Payroll



SOFTWARE INTERNATIONAL
Elm Square Andover Mass 01810 (617) 475-5040

Looking for accounting systems? Talk to the leaders.

Over 1000 of them use ours.

Infonational offers a complete system of accounting software or computer services. **General Ledger, Accounts Receivable, Accounts Payable, Fixed Assets, etc.** Programs that can be used separately or as a totally integrated system.

Check the features of our proven systems – professional documentation, on-site training programs, our 99 year unconditional warranty. See why our systems have been chosen by over 1000 of the world's leading firms. Including many banks and processing centers.

Call or write for our literature and the office nearest you. Ask to see our client list so you can find out about us for yourself.

Infonational World Headquarters, Dept. 102, P. O. Box 82477, San Diego, CA 92138 or call (714) 560-7070.

INFONATIONAL
talk to the leaders

SOFTWARE FOR SALE

McCORMACK
& DODGE
CORPORATION

HAS
DEVELOPED
MARKETED
MAINTAINED

Accounting-oriented software products over the past five years.
Over 400 companies in the U.S. are using one or more of the following:

Fixed Asset Analysis & Accounting System
Accounts Receivable System
Investment Analysis System
Accounts Payable System

McCORMACK
& DODGE
CORPORATION
One Wells Avenue
Newton, Mass. 02159
(617) 965-3760

software for sale

1401 SIMULATION
on IBM SYSTEM/3
Execute existing 1401 4K Object programs on an IBM System/3 Model 10
Features:
• All standard instructions
• 4K of core storage
• Advanced programming
• Multiply/divide
• Expanded print edit
• Punch feed read
• Sense switches
We have installed 19 System/3s, replacing 19 1401s in steel plants nationwide, using this valuable package.
Contact: W. J. Landis
Bethlehem Steel Corporation
Bethlehem, PA 18016
(215) 694-6216

ACCOUNTING SYSTEMS
PAYROLL
GENERAL LEDGER
ACCOUNTS PAYABLE
INVENTORY
ACCOUNTS RECEIVABLE

SOFTWARE FOR SALE

AUTOCODER & SPS
TRANSLATED
to BAL & PL/I

THE **TOTALTRAN** SYSTEM
1400 Object to clean source decompilation
1400 Clean source to BAL and to PL/1 translation
Contact: W. Small, President

CPU

PAYROLL PERSONNEL
x x x
ACCOUNTS PAYABLE
x x x
Modular, flexible systems with multi-company capabilities. Presently functioning for a variety of users. All programs written in COBOL.
ARGONAUT INFORMATION SYSTEMS, INC.
2140 Shattuck Ave.
#203
Berkeley, CA. 94704
(415) 845-7881

SYSX
LOOKING FOR
SOFTWARE?
Free Software Search and Package Appraisal Service
We help you locate the software packages which best meet your needs. There is no charge to you for this service. Write or call: Tom Weaver.
Systems Exchange Co.
1034 Colorado Ave.
Palo Alto, Calif. 94303
(415) 328-5490
Software Suppliers
We are currently looking for:
• Rent-A-Car IBM 370/125 DOS
• Accounting in Fortran for 32K Mini
• Cross Assembler for Intel
SYSX

GENERAL LEDGER AND FINANCIAL REPORTING SYSTEM

THE BEST GETS BETTER
ACCOUNTING IV
Proved reliable in more than 5 years of successful use, ACCOUNTING IV will be even better in 1975, with these major enhancements:
1 Generalized Data Base System
2 Audit Analyzer
3 Forecasting/Projection Module
4 Mass Change Maintenance
Call or write today for full information.
Informatics Inc
65 Route 4
River Edge, NJ 07661
New York (212) 564 1258
New Jersey (201) 488 2100
Chicago (312) 325 5960
Los Angeles (213) 822 2529

...Toward the Bottom Line

$ $ $

Inforex has expanded its line of credit from $10 million to $13 million and will use it to finance rental equipment in the U.S. Leasing II has agreed to purchase $5 million worth of Inforex systems through December 1975 and Inforex has obtained a $5 million commitment from Manufacturers Hanover Leasing Co. for sale and lease-back of systems presently owned by the company in the U.S.

$ $ $

Entrex has completed a $16 million revolving credit and term loan agreement with The First National Bank of Chicago and two other banks. The agreement continues through June 30, 1976. Funds will be used to finance leases and strengthen the firm's working capital position.

$ $ $

Dividends: IBM paid its quarterly dividend of $1.50 a share on Dec. 10 to shareholders of record Nov. 13. The amount is the same as that paid in the previous quarter. Burroughs has declared a dividend of 12.5 cents a share payable Jan. 20 to shareholders of record Dec. 20.

HP Year Figures to Exceed Projections

PALO ALTO, Calif. – Preliminary figures show Hewlett-Packard Co.'s (HP) 1974 results will exceed expectations, with earnings rising 65% and revenues 34% from those of 1973.

Earnings totaled $84 million or $3.08 a share compared with $50.7 million or $1.89 a share last year.

Revenues rose to nearly $884 million from $661.3 million in 1973.

In October, President William R. Hewlett had projected earnings would be somewhat over $75 million and sales "in the neighborhood of $870 million.

"Our shipments in the final month of the fiscal year exceeded company projections," Hewlett said. "In addition, although pretax earnings were in line with our October estimate, actual U.S. and foreign income tax liabilities turned out to be substantially lower than we projected earlier in the year."

Incoming orders in fiscal 1974 amounted to $893.1 million, up 22% over orders of $734.5 million in 1973.

International orders were $426.6 million, up 37% from $311.1 million in 1973.

Domestic orders totaled $466.4 million, up 10% from $423.4 million last year.

Incoming orders increased during each of the first three quarters of 1974 compared with comparable quarters for the previous year. In the fourth quarter, however, orders were about level with those received during the fourth quarter of 1973.

"We've made great strides in improving our inventory control and accounts receivable positions from a year ago. As a result, we reduced our short term borrowings from $120.5 million to $43.7 million, while increasing cash and equivalent from $8.9 million to $13.5 million."

Potter Revises '74 Loss Upward, Requests Trading Halt on Stock

PLAINVIEW, N.Y. – Potter Instrument Co., Inc. has revised from under $9 million to $11 million its estimated loss for 1974, curtailed manufacturing and certain other operations, reduced pay for salaried employees and instituted shorter work weeks for hourly employees.

The firm has also requested a temporary halt in the trading of its stock on the American Stock Exchange because of a delay in completing its financial statements for the year ended June 30.

A report should be out this month if all matters requiring action by third parties can be promptly completed.

The delay was caused by time required to evaluate Potter's inventory and lease base equipment and to complete certain intercompany recapitulations and to request waivers of existing defaults under loan agreements.

The entire loss will be treated as an ordinary loss from operations, said President George May, who added the anticipated loss includes inventory, lease base equipment and accounts receivable writedowns and other special provisions totaling about $8.5 million, which is the net of a $1.8 million gain from litigation settlement.

As a result of this, Potter is in default under certain covenants contained in loan agreements with institutional lenders but not in default in making any required payments of principal or interest on this indebtedness, May said.

Because of losses incurred after June 30, Potter will require additional financing or the release of funds being held by certain banks as collateral in order to meet its current obligations, he added.

Potter said it is required to pay about $1.2 million plus interest because arbitrators have ruled against it in an arbitration proceeding with Genesis 1 Computer Corp. and MAI Peripheral Corp. Liability for this obligation is reflected in the firm's June 30 financial statements.

The firm is trying to obtain additional financing and to negotiate other arrangements for payments of the award and other pending claims and indebtedness in order to enable it to continue operations.

Results Mixed At Dataproducts

WOODLAND HILLS, Calif. – Line printer sales were responsible for the major portion of the increase in six-month operating results at Dataproducts Corp., said Graham Tyson, company president.

"We expect to continue to improve our performance for the balance of this fiscal year and achieve our anticipated 25% growth rate which was forecasted at the beginning of the year," he added.

Income before special credits was up 23%.

In the six months, earnings totaled $2.8 million or 41 cents a share compared with $3.5 million or 52 cents a share, including a $1.3 million tax credit, in the year-ago period.

Revenues rose 29% to $46.5 million from $36.1 million for the same half-year period last year.

During the second quarter, Dataproducts earned $1.4 million or 20 cents a share, down from $1.8 million or 26 cents a share in the 1973 period, when there was a $648,000 tax credit.

Revenues for the quarter totaled $23.1 million compared with $17.2 million in the year-ago period.

Dataproducts' backlog stood at $51 million, 42% above that of a year ago September.

Wyly, Swiss Company Extend Loan Deadline

DALLAS – Wyly Corp. and Walter Haefner Holding AG of Zurich, Switzerland have agreed to extend from Nov. 22 to Dec. 20 the date by which Wyly must complete a $10 million bank loan.

Under an agreement with Haefner, Wyly and Haefner will invest $20 million and $10 million respectively in Wyly's data transmission subsidiary, Datran.

Earnings Reports

BRADFORD COMPUTER AND SYSTEMS
Three Months Ended Sept. 30

	a1974	1973
bShr Ernd	$.23	$.20
Revenue	13,708,000	11,127,000
Tax Cred	.....	10,000
Earnings	870,000	771,000
b9 Mo Shr	.99	.59
Revenue	43,245,000	34,923,000
Tax Cred	.....	29,000
Earnings	2,624,000	2,250,000

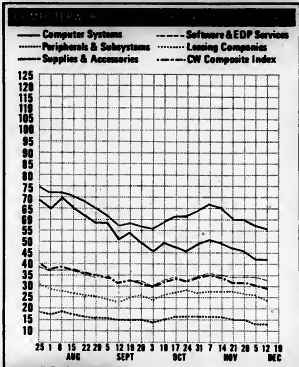
a-Includes results of Securities Processing Services, Inc., acquired in January 1974. b-Fully diluted.

PERTEC
Three Months Ended Sept. 30

	1974	1973
Shr Ernd	$.11	$.15
Revenue	10,002,000	7,850,000
Disc Op	.....	(260,000)
Tax Cred	.....	206,000
Earnings	341,000	458,000

APPLIED DATA RESEARCH
Nine Months Ended Sept. 30

	1974	a1973
Shr Ernd	$.19	$.22
Revenue	8,962,163	7,968,343
Earnings	208,947	259,825



DATA 100
Three Months Ended Sept. 30

	1974	1973
Shr Ernd	$.43	$.33
Revenue	18,195,000	11,073,000
Tax Cred	547,000	489,000
Earnings	1,307,000	1,018,000
9 Mo Shr	1.06	.79
Revenue	48,097,000	28,164,000
Tax Cred	1,334,000	1,068,000
Earnings	3,240,000	2,244,000

DATAPRODUCTS
Three Months Ended Sept. 29

	1974	1973
Shr Ernd	$.20	$.26
Revenue	23,114,000	17,239,000
Tax Cred	.....	648,000
Earnings	1,355,000	1,794,000
9 Mo Shr	.41	.52
Revenue	46,545,000	36,119,000
Tax Cred	.....	1,266,000
Earnings	2,761,000	3,504,000

TALLY
Three Months Ended Sept. 30

	1974	a1973
Revenue	$4,503,331	$3,429,957
Tax Cred	3,000	.....
Loss	175,683	449,376
9 Mo Shr	.05	.....
Revenue	12,957,560	9,356,302
Spec Item	b3,000	d(111,261)
Earnings	111,054	(1,202,970)

a-Restated to reflect accounting change. b-Tax credit. d-From disposition of a division.

SANDERS ASSOCIATES
Three Months Ended Oct. 25

	1974	1973
Shr Ernd	$.10	$.30
Revenue	38,392,000	38,749,000
Tax Cred	104,000	509,000
Earnings	a434,000	1,377,000

a-Includes a $324,000 gain on the sale of a small manufacturing facility.

DATA DISC
Three Months Ended Sept. 27

	1974	1973
Shr Ernd	$.01	$.21
Revenue	2,576,016	2,329,549
Earnings	5,593	212,440
9 Mo Shr	.20	.58
Revenue	7,525,399	7,499,298

TYMSHARE
Nine Months Ended Sept. 30

	1974	1973
Shr Ernd	$.64	$.47
Revenue	23,995,362	17,476,943
Tax Cred	.....	258,000
Earnings	1,970,927	1,416,894

Computerworld Stock Trading Summary

All statistics compiled, computed and formated by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1974 RANGE (1)	CLOSE DEC 12 1974	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	63-217	74 5/8	+ 7/8	+1.1
O	COMPUTER AUTOMATION	2- 14	2 1/2	+ 1/4	+11.1
N	CONTROL DATA CORP	10- 38	10 1/4	+ 1/8	+1.2
N	DATA GENERAL CORP	13- 38	13 7/8	- 7/8	-5.9
O	DATAPOINT CORP	5- 15	5 1/2	+ 1/4	+4.7
O	DIGITAL COMP CONTROL	1- 5	1	- 3/4	-42.8
N	DIGITAL EQUIPMENT	51-121	56	+1 1/8	+2.0
N	ELECTRONIC ASSOC.	1- 3	1 1/4	0	0.0
A	ELECTRONIC ENGINEER.	4- 11	4 3/4	0	0.0
N	FOXBORO	19- 48	24 3/4	- 7/8	-3.4
O	GENERAL AUTOMATION	7- 40	7 3/4	+ 3/4	+10.7
O	GRI COMPUTER CORP	1- 2	1/8	0	0.0
N	HEWLETT-PACKARD CO	54- 00	56 1/4	+1 1/8	+2.0
N	HONEYWELL INC	18- 86	19 3/4	+1 1/8	+6.0
N	IBM	152-251	169 1/2	+3 1/4	+1.9
O	INTERDATA INC	8- 22	13 1/8	- 1/8	-0.9
O	MICRODATA CORP	2- 5	1 1/2	0	0.0
N	NCR	14- 48	14 3/8	+ 1/8	+0.8
N	RAYTHEON CO	21- 39	24 1/2	+1 5/8	+7.1
N	SINGER CO	10- 40	11	+ 3/4	+7.3
N	SPERRY RAND	24- 44	27	+1 1/4	+4.8
A	SYSTEMS ENG. LABS	1- 3	1	- 1/8	-11.1
N	TEXAS INSTRUMENTS	60-115	66 3/8	-1 1/2	-2.2
O	ULTIMACC SYSTEMS INC	1- 2	5/8	- 1/8	-16.6
N	VARIAN ASSOCIATES	6- 13	6 1/8	- 3/8	-5.7
N	WANG LABS.	7- 20	7 1/4	- 1/8	-1.6
N	XEROX CORP	54-127	54 1/4	-1 3/8	-2.4

LEASING COMPANIES

EXCH		1974 RANGE (1)	CLOSE DEC 12 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	BRESNAHAN COMP.	2- 2	2 1/8	0	0.0
O	COMDISCO INC	1- 7	1	+ 1/8	+14.2
A	COMMERCE GROUP CORP	3- 6	2 1/2	- 1/8	-4.7
O	COMPUTER EXCHANGE	1- 1	1/8	0	0.0
A	COMPUTER INVSTRS GRP	0- 4	1/4	- 1/4	-44.4
O	COMP. INSTALLATIONS	1- 1	1/4	0	0.0
O	DATRONIC RENTAL	1- 1	3/4	+ 1/8	+20.0
A	DCL INC	0- 1	1/4	-	-20.1
N	DPF INC	2- 5	2 5/8	0	0.0
O	EDP RESOURCES	2- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 3	7/8	- 1/8	-12.5
A	GREYHOUND COMPUTER	2- 6	1 7/8	- 3/8	-16.6
A	ITEL	3- 6	3 1/8	- 3/8	-10.7
N	LEASCO CORP	5- 12	5 7/8	- 1/4	-4.0
O	LEASPAC CORP	1- 2	1/2	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 5	1 3/8	- 1/8	-8.3
A	PIONEER TEX CORP	2- 10	2	- 1/8	-5.8
A	ROCKWOOD COMPUTER	0- 1	1/4	-	-16.5
N	U.S. LEASING	5- 24	8 5/8	- 1/8	-1.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1974 RANGE (1)	CLOSE DEC 12 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	5/8	0	0.0
A	APPLIED DATA RES.	1- 3	1	0	0.0
O	APPLIED LOGIC	1- 1	1/8	0	0.0
N	AUTOMATIC DATA PROC	21- 57	29 1/2	0	0.0
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	4- 6	3	0	0.0
O	COMPUTER DIMENSIONS	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER HORIZONS	1- 5	1/2	- 3/4	-60.0
O	COMPUTER NETWORK	1- 2	1/2	0	0.0
N	COMPUTER SCIENCES	2- 4	2	0	0.0
O	COMPUTER TASK GROUP	1- 1	3/8	0	0.0
O	COMPUTER TECHNOLOGY	1- 1	1/2	0	0.0
O	COMPUTER USAGE	2- 4	1 7/8	- 1/8	-6.2
O	COMRESS	1- 1	1/4	0	0.0
O	COMSHARE	2- 4	3	- 5/8	-17.2
M	CONDURA CORP	1- 4	1	0	0.0
O	DATATAB	1- 3	7/8	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	11- 25	12 5/8	+ 3/8	+3.0
O	INFORMATIONAL INC	1- 2	3/8	0	0.0
O	I.D.A. DATA CORP	1- 1	1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	+ 1/8	+25.0
O	KEANE ASSOCIATES	2- 4	1 3/4	0	0.0
O	KEYDATA CORP	1- 6	2	0	0.0
O	LOGICON	2- 5	2 7/8	+ 1/4	+9.5
A	MANAGEMENT DATA	1- 2	1 1/8	- 1/8	-10.0
O	NATIONAL CSS INC	5- 37	6 1/4	+ 1/4	+4.1
O	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
A	ON LINE SYSTEMS INC	17- 38	8 1/2	-4 7/8	-33.0
N	PLANNING RESEARCH	2- 3	2 1/8	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	+ 1/8	+25.0
O	RAPIDATA INC	1- 5	1 5/8	- 1/8	-7.1
O	SCIENTIFIC COMPUTERS	1- 1	7/8	- 1/8	-12.5
O	SIMPLICITY COMPUTER	1- 1	1/2	0	0.0
O	TCC INC	1- 1	1/8	0	0.0
O	TYMSHARE INC	6- 12	6	+ 1/8	+2.1
O	UNITED DATA CENTER	2- 4	2 1/2	0	0.0
A	URS SYSTEMS	2- 4	2	+ 1/8	+6.6
N	WYLY CORP	2- 5	1 3/4	0	0.0

PERIPHERALS & SUBSYSTEMS

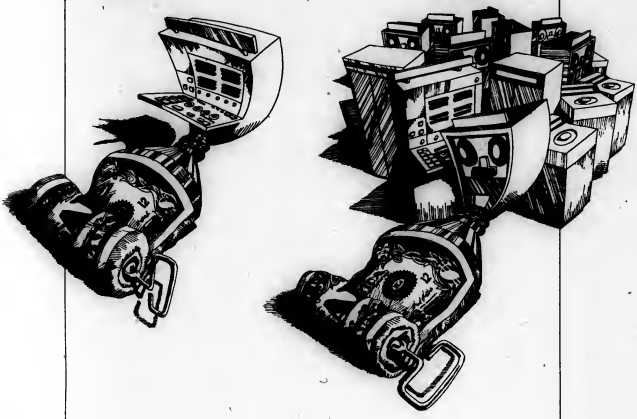
EXCH		1974 RANGE (1)	CLOSE DEC 12 1974	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	3- 11	3	- 1/2	-14.2
O	ADVANCED MEMORY SYS	1- 7	1 1/4	+ 1/8	+11.1
N	AMPEX CORP	3- 5	2 1/2	- 3/8	-13.0
O	ANDERSON JACOBSON	2- 4	1 1/2	0	0.0
O	BEEHIVE MEDICAL ELEC	2- 7	1 1/2	- 1/4	-14.2
A	BOLT,BERANEK & NEW	5- 9	4 3/4	- 1/8	-2.5
N	BUNKER-RAMO	4- 8	3 1/2	- 1/2	-12.5
A	CALCOMP	4- 11	3 5/8	- 3/8	-9.3
O	CAMBRIDGE MEMORIES	3- 14	2 5/8	0	0.0
O	CENTRONICS DATA COMP	7- 23	7 3/4	-2 1/8	-21.5
O	CODEX CORP	8- 16	14 1/2	- 3/4	-4.0
O	COGNITRONICS	1- 2	3/8	0	0.0
O	COMPUTER COMMUN.	1- 2	1/2	+ 1/8	+33.3
A	COMPUTER EQUIPMENT	1- 2	1	- 1/8	-11.1
O	COMPUTER MACHINERY	1- 5	1 1/4	- 1/8	-0.0
O	COMPUTER TRANSCEIVER	1- 2	5/8	0	0.0
N	CONRAC CORP	10- 22	11 1/2	+ 1/8	+1.0
O	DATA ACCESS SYSTEMS	2- 3	2 1/2	0	0.0
O	DATA 100	4- 13	4 1/4	- 1/2	-10.5
A	DATAPRODUCTS CORP	2- 4	2 1/8	- 1/4	-10.5
O	DATA RECOGNITION	1- 1	1/4	0	0.0
O	DATA TECHNOLOGY	2- 4	1 3/4	0	0.0
O	DECISION DATA COMPUT	3- 13	2 7/8	- 1/8	-4.1
O	DELTA DATA SYSTEMS	1- 2	3/8	- 1/8	-25.0
O	DI/AN CONTROLS	1- 2	1/2	0	0.0
N	ELECTRONIC M & M	1- 4	1	- 1/4	-20.0
O	FABRI-TEK	1- 3	1/2	- 1/8	-20.0
O	GENERAL COMPUTER SYS	1- 4	1	- 1/4	-20.0
N	GENERAL ELECTRIC	30- 65	32 5/8	-2	-5.7
N	HAZELTINE CORP	2- 7	2 1/8	- 1/4	-10.5
O	INFOREX INC	2- 5	1 1/2	0	0.0
O	INFORMATION DISPLAYS	1- 1	1/8	0	0.0
O	INFORMATION INTL INC	6- 18	6 1/2	+ 1/2	+8.3
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/8	0	0.0
N	MEMOREX	2- 5	1 3/4	- 1/2	-22.2
A	MILGO ELECTRONICS	6- 18	6 5/8	- 1/8	-1.8
N	MOHAWK DATA SCI	1- 4	1 3/8	+ 1/4	+22.2
O	ODEC COMPUTER SYST.	1- 3	3/4	0	0.0
O	OPTICAL SCANNING	3- 6	2	0	0.0
O	PERTEC CORP	1- 6	1 5/8	- 1/8	-7.1
A	POTTER INSTRUMENT	1- 5	1 3/4	0	0.0
O	PRECISION INST.	1- 3	1/2	- 1/4	-33.3
O	QUANTOR CORP	2- 8	2 1/2	- 1/4	-0.0
O	RECOGNITION EQUIP	2- 5	1 7/8	+ 1/8	+7.1
N	SANDERS ASSOCIATES	2- 8	2	- 1/4	-11.1
O	SCAN DATA	1- 2	1/2	- 1/8	-20.0
O	STORAGE TECHNOLOGY	6- 15	6 1/2	+ 1/2	+8.3
O	SYCOR INC	4- 13	4 1/2	+ 1/4	+5.0
O	TALLY CORP.	1- 4	1	0	0.0
O	TEC INC	2- 7	1 1/2	- 1/4	-14.2
N	TEKTRONIX INC	20- 48	20	- 1/8	-0.6
N	TELEX	3- 4	2 3/4	- 1/2	-15.3
O	WANGCO INC	3- 13	3 1/2	+ 1/8	+3.7
O	WILTEK INC	1- 8	1	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1974 RANGE (1)	CLOSE DEC 12 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	4- 6	4 1/4	0	0.0
A	BARRY WRIGHT	4- 7	4 1/4	0	0.0
O	CYBERMATICS INC	1- 2	1/2	0	0.0
A	DATA DOCUMENTS	23- 54	30	+ 3/8	+1.2
O	DUPLEX PRODUCTS INC	6- 17	13 1/8	-1 5/8	-11.0
N	ENNIS BUS. FORMS	4- 7	4 5/8	+ 1/8	+2.7
O	GRAHAM MAGNETICS	4- 11	6	- 1/4	-4.0
O	GRAPHIC CONTROLS	4- 11	7 1/2	0	0.0
N	3M COMPANY	46- 79	51	+5	+10.0
O	MOORE CORP LTD	33- 57	40 1/2	+1 3/4	+4.5
N	NASHUA CORP	19- 45	18 3/4	-3 3/4	-16.0
O	REYNOLDS & REYNOLDS	6- 35	7 1/2	+1	+15.3
O	STANDARD REGISTER	10- 14	11	0	0.0
O	TAB PRODUCTS CO	4- 11	4	-1	-20.0
N	UARCO	13- 23	18 1/4	+ 3/4	+4.2
A	WABASH MAGNETICS	3- 7	3	0	0.0
N	WALLACE BUS FORMS	14- 24	14 7/8	+ 1/8	+0.8

$51,238 per month rental

$48,406 per month lease



ITEL squeezes more out of your computer dollar than IBM.

Now you can get a whole computer system from ITEL for less than what IBM charges for just a central processing unit.

The numbers speak for themselves: For $51,238 a month, IBM rents you a single 370/158 CPU (includes two extra shifts). But for $48,406, ITEL leases you that same 370 CPU with ITEL Monolithic Memory, 24 ITEL disk drives plus their controllers, as well as 24 ITEL tape drives with their controllers.

To put it another way, if you were to rent a comparable system from IBM, it would cost you $81,846 a month. Almost double our price.

Furthermore, we'll lease any kind of 370 computer package at proportional savings. And we'll make sure that all terms and provisions are custom-tailored to meet your exact financial objectives.

At ITEL, we couldn't have acquired over half a billion dollars in IBM computer leasing experience without doing more for your money.

Your financial alternative.

ITEL CORPORATION
DATA PRODUCTS GROUP

One Embarcadero Center, San Francisco, California 94111. Phone: (415) 983-0000